Clinician Scientists als Akteure im Kontext Translationaler Forschung: Eine kritische Auseinandersetzung mit Professionsdynamiken in der (Bio-)Medizin

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Kumulativer Aufbau

Die vorliegende Dissertation ist kumulativ erstellt und basiert auf vier Einzelstudien, die veröffentlicht und/oder zur Veröffentlichung angenommen oder in wissenschaftlichen Fachzeitschriften zur Begutachtung eingereicht sind (Stand: Mai 2019):

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Zusammenfassung

Clinician Scientists werden im Kontext einer Translationalen Forschung als Schlüsselfiguren thematisiert, insbesondere seit ihnen das Potenzial zugesprochen worden ist, biomedizinische Grundlagenforschung und medizinische Praxis auf praktische Weise miteinander verbinden zu können. Damit adressiert das Berufsbild des Clinician Scientists auf individueller Ebene das sogenannte ‚valley of death', welches metaphorisch zentrale Übersetzungslücken im biomedizinischen Erkenntnis- und Entwicklungsprozess markiert. Ungeachtet ihrer besonderen Position befinden sich Clinician Scientists noch immer in einer beruflichen Nische, der es offensichtlich nicht gelingt, die Translationsanforderungen auf der praktischen Ebene tatsächlich erfolgreich zu vermitteln. Vor diesem Hintergrund fragt die vorliegende Arbeit nach dem Professionszustand des Clinician Scientists und bedient sich dabei eines neo-pragmatischen Zugangs, der es ermöglicht Kritik und Empörung, welche die im Feld befindlichen Akteure gegenüber ihrer translationsorientierten Umwelt formulieren, für eine Soziologie der Kritik zu nutzen. Der analytische Bezugsrahmen ermöglicht sodann eine Beleuchtung des Professionszustands über individuelle Krisenzustände, die eine öffentliche Kritik an den eigenen professionellen Zuständen freisetzt. Die Arbeit leistet damit eine Beschreibung kritischer Potenziale, die im Kontext von Professionsentwicklungen gedeutet werden und offenbart im Ergebnis ein ambivalentes Verhältnis zwischen den Konzeptionen Translation und Profession: Ungeachtet ihres theoretisch augenscheinlich professionsfördernden Charakters avanciert die Translationale Forschung zum individuell-situativen Krisenherd und be- bzw. verhindert somit zugleich eine professionelle Entwicklung des Clinician Scientists.

Summary

Clinician scientists are described as a key solution towards the problem of translational research in the field of (bio)medicine, especially since they are perceived to have the potential to combine biomedical research and clinical practice. Translational research overall addresses the 'translation gap' between biomedical research findings on the one hand and clinical practice and applications on the other, which constitutes a major challenge towards the current biomedical research system. Despite their importance for translational problems clinician scientists still constitute a 'rare breed', struggling in fulfilling expectations of translational research on the individual level. In the light of this problematization, the cumulative thesis aims to explore the professional nature of the clinician scientist with the help of a neo-pragmatic approach by making use of critique and indignation individuals utter against their translational ecology. The analytical framework therefore allows to analyze professional development via individual situations of crisis. The thesis thus contributes to a description of critical potentials from individuals involved and reveals an ambivalent relationship between the concepts of translation and profession: despite its obviously supporting character translational research turns into a moment of crisis actually hindering and, respectively preventing clinician scientists from becoming a profession.

1 EINLEITUNG

Clinician Scientists werden im Kontext Translationaler Forschung – oder kurz Translation – als Schlüsselfiguren diskutiert (Wilson-Kovacs und Hauskeller 2012; Etienne Vignola-Gagné 2014), da sie mit ihrer spezifischen Rollenbeschaffenheit auf das im Feld der Biomedizin mittlerweile relativ breit diskutierte Problem der unzureichenden Translation reagieren. Im Wesentlichen wird mit Translation die Herausforderung umschrieben, Grundlagenwissen in die medizinische Anwendung bis hinein in den Bereich ‚Public Health' zu übersetzen (Macleod et al. 2014; Butler 2008; Marincola 2003; Fudge et al. 2016; Milewicz et al. 2015). Translation adressiert somit konkret die Übersetzungslücken und -hürden im biomedizinischen Erkenntnis- und Entwicklungsprozess. Vor diesem Hintergrund verweisen Vertreter/innen aus der Wissenschaftspolitik (DFG 2015; Wissenschaftsrat 2016; NIH 2015) seit jüngerer Zeit immer wieder darauf, dass Clinician Scientists mit ihrer beruflichen Konstitution die Übersetzunglücke zwischen biomedizinischer Forschung sowie medizinischer Praxis fokussieren und damit in der Lage sind das metaphorische „valley of death" (Butler 2008) zu überwinden.

Mit der Einrichtung von Programmen, welche die Ausbildung von Clinician Scientists zum Gegenstand haben, wird der Versuch sichtbar Translation gezielt auf institutioneller Ebene zu verankern. Mit der Einrichtung derartiger Ausbildungsprogramme wird das Vorhaben, die Ausbildung von hybriden professionellen Rollen zu verfestigen und zu verstetigen, die sodann auf personaler Ebene Translationsprobleme überwinden, systematischer verfolgt. Obwohl derartige Programme in den letzten Jahren zunehmend an Aufmerksamkeit und Zuspruch erfahren haben, mangelt es dem Aufbau und der Struktur an einheitlichen Standards, die vorgeben wie eine Clinician-Scientist-Ausbildung konkret gestaltet sein sollte. Vor dem Hintergrund dieses Spannungsfelds zwischen Konsolidierungsbestrebungen und Dezentralisierungsmomenten scheint es wenig überraschend, dass eine fehlende Professionalisierung des Clinician-Scientist-Berufsbildes zu beobachten ist, welche die als Clinician Scientists Ausgebildeten tatsächlich als eigenständiges Berufsbild definiert: Das Berufsbild des Clinician Scientists ist

weder an spezifische Berufs- und Tätigkeitsfelder noch an spezifische Zuständigkeitsbereiche geknüpft. Die Hauptaufgaben, die aktuell von Clinician Scientists ausgeführt werden, können in der Regel auf die Professionen Wissenschaft und Medizin zurückgeführt werden. Die Wissens- und Erkenntnisproduktion ist einerseits zentraler Bestandteil einer wissenschaftlichen Profession, wohingegen die Patientenbehandlung und -heilung auf der anderen Seite ein zentrales Aufgabenfeld der medizinischen Profession begründet (Lemoine 2008; Freidson 1988). Durch die, auf der wissenschaftspolitischen Diskursebene, geforderte Zusammenführung dieser beiden professionellen Tätigkeitsfelder qua persona wird der Clinician Scientist sodann zu einem Akteur stilisiert, der das Phänomen ‚Krankheit' als ein zweifach gelagertes Phänomen verstehen kann: als ein wissenschaftliches Problem qua seiner Wissenschaftsprofession und als ein medizinisches Problem qua seiner Medizinprofession, den Gesundheitszustand des Patienten betreffend (Roberts et al. 2012, 266). Über diese kompakte und zu Teilen sicher zu kurz kommende Beschreibung wird deutlich, dass die berufliche Konzeption des Clinician Scientists im Wesentlichen in den zwei Professionen Medizin und Wissenschaft verwurzelt ist, was sich gleichsam auf einer oberflächlichen Ebene in seiner Namensgebung spiegelt, die sich aus den englischen Wörtern ‚Clinician', zu Deutsch Kliniker/in und ‚Scientist', zu Deutsch Forscher/in, zusammensetzt. Unklar bleibt bisweilen jedoch, inwiefern sich das Berufsbild des Clinician Scientists von seinen professionellen Wurzeln abgrenzen kann und ein eigenständiges Professionsbild zeichnet. Diese bestehende Unklarheit leitet die vorliegende kumulative Dissertation an, die sodann danach fragt, inwiefern Clinician Scientists als eine eigenständige Profession im Feld der Translation gedeutet und beschrieben werden können?

Zur Beantwortung der Forschungsfrage basiert die Dissertation auf vier Einzelstudien, die in der vorgegebenen Reihe die Kapitelstruktur ergeben:

Tabelle 1: Übersicht der Einzelstudien

Nr.	Titel des Beitrags
I	The multiple meanings of translational medicine. Negotiating medical science.
II	What are clinician scientists expected to do? The undefined space for professionalizable work in translational biomedicine.
III	Virtuelle Identitäten. Science Blogs als Kommunikationsformat öffentlicher Kritik.
IV	Science Blogs as Critique – Building Public Identities in the Field of Translational Research.

Mit der genannten Fragestellung knüpft die kumulative Dissertation an bestehende Arbeiten an, welche die Hürden und Problemlagen hinsichtlich des Clinician-Scientist-Berufsbildes erörtern (Lemoine 2008; Lander et al. 2010; Etienne Vignola-Gagné 2014; Kluijtmans et al. 2017). Gleichsam versucht sie ein neues Licht auf die Frage der Professionalisierung zu werfen, indem sie das Umfeld der Akteure, für die Erkenntnisproduktion konstruktiv wendend, in die Untersuchung einbezieht. Dieses Umfeld der Akteure zeichnet sich durch im Diskurs vorhandene Translationsansprüche aus. Translation wird mit einer derartigen analytischen Setzung für die Individuen zu einer Form von Umwelt, die situativ Handlungen strukturiert, indem sie Praktiken des biomedizinischen Erkenntnis- und Entwicklungsprozesses in Wert setzt und dadurch Erwartungen an die Handlungsebene freisetzt. Die Inwertsetzung wird auf der anderen Seite mittels Reaktionen der Akteure, die sich auf die in der Umwelt gesetzten Anforderungen richten, in die situative Umwelt zurückgespeist. Die Reaktionen sind dabei im Wesentlichen durch Kritik gekennzeichnet.

Translation wird damit zu einem Ort an dem die reziproke Verhandlung von Translationsanforderungen sowie subjektiv-situativen Bewältigungsstrategien sichtbar wird und zeigt damit, dass die professionale Entwicklung von den vorherrschenden Translationsdynamiken beeinflusst wird. Die vorherrschende Unbestimmtheit des Translationsbegriffs schlägt sich in einer Unbestimmtheit auf professioneller Ebene nieder. Eine professionssoziologische Fragestellung, die im weiteren Verlauf eine neo-pragmatische Analyseperspektive verknüpft, offenbart sodann die Reproduktionslogiken der Rollendiffusität. Damit leistet die vorliegende Arbeit einen Beitrag dahingehend, wie sich die Translationsprobleme auf der Akteursebene verdeutlichen und schlägt somit eine Brücke zwischen einer Soziologie der Kritik und einer Professionssoziologie.

Die vorliegende Arbeit gliedert sich in acht Teile und beginnt in Kapitel 2 mit einer Auseinandersetzung über die Translationale Forschung als begrifflichen Gegenstand, den die unterschiedlichen am Feld partizipierenden Akteure praktisch verhandeln, und diesem dadurch seine Bedeutungsstruktur verleihen. Daran anschließend findet sich Kapitel 3, welches die praktische Auseinandersetzung von Clinician Scientists mit den bestehenden Erwartungen aus dem Translationsdiskurs erörtert, wodurch die Dualität von Handeln und Struktur im individuellen Situationskontext analytisch-empirisch offenbart wird. Daraufhin erfolgt in Kapitel 4 eine theoretisch-konzeptionelle Aufarbeitung von Kritik als einem zentralen analytischen Element zur Ermittlung der Identitätskonzeption professioneller Gruppen; gefolgt von einer empirischen Analyse über die Zustände der Empörung, die Clinician Scientists gegenüber ihrer strukturierenden Translationsumwelt formulieren in Kapitel 5. Im Weiteren fasst das Rahmenpapier sodann die vier, hier als einzelne Kapitel präsentierten, Einzelstudien in Kapitel 6 kurz zusammen und bereitet damit auf die Diskussion der Ergebnisse in Kapitel 7 vor. Abgeschlossen wird die Arbeit mit einem Fazit.

2 THE MULTIPLE MEANINGS OF TRANSLATIONAL MEDICINE: NEGOTIATING MEDICAL SCIENCE

2.1 INTRODUCTION[1]

In 2008, Declan Butler, a journalist at Nature, suggested that you could "[a]sk ten people what translational research means and you`re likely get ten different answers" (Butler 2008, 841). Butler's statement documents the fuzziness of the translational research terminology that scholars, practitioners, and policymakers were struggling with at the time. Several distinct understandings were circulating about how the term was used and what it meant. Yet, almost a decade later, there is still no consensus on a definition of translational research and it remains a contested matter. Since the 1990s, and especially since the establishment of the US NIH roadmap in 2003 and the accompanying establishment of Clinical and Translational Science Centers and then the launch of the Clinical and Translational Science Award (CTSA) program in 2006, there has been a massive expansion of this terminology. Many articles have been published, new journals have been launched and even entire organisations have been newly established using this terminology, but they have done so despite the absence of a clear definition and commonly shared understanding of "translational research". Of course, there is a debate amongst scholars, practitioners, and policymakers about the 'valley of death', wherein already existent knowledge about cures and treatments gets lost, and about the 'gap between bench and bedside' that locates translational research somewhere between biomedical laboratory research and clinical trials (Butler 2008). At the

[1] Dieses Kapitel ist eine Preprint-Fassung des veröffentlichten und zitierbaren Beitrages: Krüger, Anne K.; Hendriks, Barbara; Gauch, Stephan (2018): "The multiple meanings of translational medicine. Negotiating medical science". SocArXiv. November 26. Doi: 10.31235/osf.io/w6xjn.

same time, there are, however, other debates taking place, for instance, in nursing science about how to translate new medical interventions to the patient's bedside (Chesla 2008). Here, translation 'to the bedside' does not stop where clinical trials end. Instead, this take on the 'bedside' starts only then when proven interventions need to be implemented into daily practice. Furthermore, discussions about translation 'from bedside to bench' claim that clinical research and everyday medical practice can and should provide the research questions for basic biomedical research (Marincola 2003).

Translational research is a paradigm which dominates discussions about the quality, the utilization, and the benefit of (bio)medical research – however with different emphases. In our work, we do not seek to find a 'correct' definition of translational research, but instead ask how actors using this terminology for describing their own research make sense of it. To do so, we asked three questions. First, we wanted to know which actors are engaged in the debate about translational research. Second, we asked for the different meanings of translational research. Third, we asked which actors refer to which meaning of translational research when using the term. In answering these questions, we aimed to highlight the role this terminology plays in defining what medical science is about.

We begin this essay by sketching out the emergence of the translational research terminology in different settings such as biomedical research and nursing science. We then discuss some theoretical concepts that might help us to sharpen our analytical focus for answering our research questions, and follow this by presenting our methodology and discussing our results. Finally, we conclude with some insights into the challenge that translational research provides for a current understanding of research practices and research objects in medical science.

2.2 THE EMERGENCE OF TRANSLATIONAL RESEARCH

The debate about the understanding and practising of translational research took off when difficulties in knowledge transfer between laboratory research and clinical practice were diagnosed and became a matter of debate in the political arena in the 1990s. Yet, first discussions about the relationship between lab and clinic date back to the late nineteenth century, when experimental laboratory work began to inform and change medical practice (Kraft 2013, 22; Sturdy 2011, 740 f.). This development was fostered in the 1960s, when scientific and technical advances, such as e.g. the deciphering of the genetic code in 1966, led to the emergence of what came to be labelled 'molecular biology' (Strasser 2002). The rise of molecular biology supported a continuously growing separation into patient-based and laboratory research because it changed the understanding of diseases towards "faulty molecules, typically defective proteins and, later, genes" (Kraft 2013, 28). Consequently, this development also changed the location of medical study from the clinic to the lab leading biomedical researchers to distancing themselves from medical practice (Strasser 2002, 534) while provoking discussions on an overly scientific medicine on the part of practitioners (Sturdy 2011, 747). Hence, with the rise of molecular biology and the ongoing separation of clinical and laboratory research a linear innovation model evolved in the field of medicine known as the 'from bench to bedside' perspective, which is a prominent slogan in the current debate about translational research (Mittra 2013; Van der Laan, Boenink 2013).

Yet the perception of a growing knowledge gap between bench and bedside leading to the rise of translational research was less provoked by an actual lack of knowledge transfer and communication between laboratory and clinical research. On the contrary, the rise of molecular biology was promoted as of immediate importance for medical practice (Strasser 2002, 533 ff.) and, in turn, "problematics, perspectives and practices that developed within the sphere of clinical medicine" (Sturdy 2011, 744) have also always informed laboratory research (see also Mittra 2013, 106). Instead, Sturdy (2013) argues that the talk about a knowledge gap leading to the rise of translational research was rather created through rhetoric and corresponding political measures. He

finds that, since the 1970s, the separation of clinical and basic biomedical research became manifested through governmental funding policies and a growing pharmaceutical industry that invested huge amounts of money into basic research. Clinical research was, instead, reconfigured as the deliverer of pharmaceutical products by degrading it to clinical trials as the gold standard of validating and applying biomedical inventions.

Consequently, by the end of the 1990s, concerns regarding a 'return on investment' (Kraft 2013, 31) or a so-called 'payoff' (Cockburn 2006, 2) were raised as the National Institutes of Health (NIH) had redoubled its funds between 1993 and 2001 from $ 13.6 billion to over $ 27 billion (Kraft 2013, 31), what the director of the National Institute of General Medical Sciences (NIGMS) Jon R. Lorsch has called the "NIH budget-doubling period" (Lorsch 2015, 1579). In the context of the NIH budget-doubling period, the biomedical research system was confronted with expectations of higher output of innovative therapies and cures. Considering the amount of money that was invested in biomedical research, however, commentators like professor of management Iain M. Cockburn or the pharmaceutical chemist Hugo Kubinyi suggested that the development of new drugs had been falling continuously since the 1960s (Cockburn 2006; Kubinyi 2003). The perceived lack of innovation in the pharmaceutical industry gave rise to the proclamation of a 'productivity crisis' (Barden and Weaver 2010).[2] The felt mismatch between the huge amount of financial support of biomedical research and the corresponding development of new drugs led regulators, academic researchers and investment analysts to the opinion that "the mechanism for translating science into drugs […] ha[d] broken down (Cockburn 2006, 3).

The translational research terminology in biomedical research thus grew out of debates about a lack of innovation due to perceived deficits in knowledge transfer between lab and clinic compared to the amounts of money that were spent. The immense growth of publications on translational research between 1994 and 2013 (Blümel et al. 2015; Rubio et al. 2010; Butler 2008) reflects the

[2] For a critical view see Mittra 2013.

discussion about this 'broken down' system. Scholars, practitioners, and moreover policymakers (Etienne Vignola-Gagné et al. 2013) started regarding translational research as the appropriate mechanism to close the gap between bench and bedside.

Especially clinical researchers and practitioners have tried, though, to reframe translational research from a different point of view. Instead of simply from bench to bedside, they have claimed that translational research should rather be looked upon as a 'two way road' (Marincola 2003, 1), with translation taking place from 'bench to bedside' as well the other way round. The idea behind this understanding of translational research is that questions in biomedical research should be informed by problems that clinicians are confronted with in clinical research and practice. They claim that this perspective has, however, been lost with an overly emphasis on basic research and basic research funding (Marincola 2011).

Meanwhile, rather than focusing on translations between lab and clinic, bench and bedside, nursing science focuses on a different idea of translation that tackles the question of how new research results can be translated into evidence-based guidelines and thus into everyday clinical practice (Chesla 2008). As a result, nursing science has developed its own definition of translational research as "the scientific investigation of methods, interventions, and variables that influence adoption of evidence-based practices (EBPs) by individuals and organisations to improve clinical and operational decision making in health care" (Titler 2004, 1). The emergence of this definition came at an October 2003 conference titled 'Advancing Quality Care Through Translational Research'. Held to discuss the future of translational research and to enhance the quality in nursing care, this conference was supported by the US Agency for Healthcare Research and Quality (AHRQ), and included members of the National Association of Pediatric Nurse Practitioners and the National Institute of Nursing Research as important attendees (Titler 2004). The idea of engaging health care researchers and practitioners in a dialogue about the results of translational research had itself grown out of a new programme called TRIP (Translating Research into Practice), funded by the AHRQ and the Health Service Research and Development Service (HSR&D)

within the Department of Veteran Affairs. TRIP, its creators claimed, would foster "innovative and rigorous research and evaluation projects related to the translation of research findings into measurable improvements in quality, patient safety, health care outcomes and cost, use, and access" (AHRQ 2004, 11).

The use of the term "translational research" in nursing science dates back much further, though, to the late 1970s when Jean Johnson published 'Translating Research into Practice' (Mitchell 2004). Mitchell points out that the concept currently termed 'translation' has been part of nursing research for many decades. However, the language used to describe this practice has shifted, from 'research translation' in the 1970s, to 'research utilization' in the 1980s, to 'evidence-based practices' in the 1990s, and then reverted back to 'translation' in the 2000s (Mitchell 2004, 214). Graham et al. (2006) have developed this argument further, and propose an entirely new phrase— 'knowledge-to-action cycle'—as a replacement.[3] They hope this new terminology will provide some conceptual clarity, in response to "the growing awareness that research findings are not making their way into practice in a timely fashion, coupled with the current emphasis on evidence-based, cost-effective, and accountable health care" (Graham et al. 2006, 14).

These two distinct perspectives on translational research, from lab to clinical research and practice and from clinical research into practice and policymaking, are also present in current models that seek to describe the translational research process (see for an overview Blümel et al. 2015; Trochim et al. 2011). The Institute of Medicine`s Clinical Research Roundtable, for instance, distinguishes between two translational blocks labeled 'T1' and 'T2'. They define T1 as "the transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy, and prevention and their first testing in humans", and T2 as "the

[3] For more information on the knowledge-to-action cycle see also http://ktclearinghouse.ca/knowledgebase/knowledgetoaction and Straus, Tetroe, and Graham 2013

translation of results from clinical studies into everyday clinical practice and health decision making" (Woolf 2008, 211). Still others go beyond the definition of two translational blocks, citing a third translational phase (T3) "which has been described as the 'how' of healthcare delivery" (Abernethy and Wheeler 2011, 26).[4] The key aspect of T3 is "to ensure that evidence-based interventions effectively reach individuals and populations whose health can benefit" (Abernethy and Wheeler 2011, 26; see also Westfall, Mold, and Fagnan 2007). More recently, researchers and policymakers have introduced another variation, in some cases labeled as T4. This understanding of translation is concerned with "proactively communicat[ing] its scientific accomplishments to its stakeholders — whether to the public through community outreach and engagement, to industry via technology transfer, or to government through partnerships" (National Institute of Environmental Health Sciences 2011). Still others, meanwhile, talk about T5 (Terzic and Waldman 2010) or even start with T0 (Schully et al. 2012; Kerner et al. 2012; Lam et al. 2015).

This short overview about the emergence of the translational research terminology already shows that translational research has become a prominent terminology in the field of medical science. Yet, at the same time, it is still highly contested terrain. There exists no commonly shared understanding that could help to clarify what people mean when using this terminology. Nonetheless, the idea of translational research has spread widely as a new concept for doing research in a better way. Yet, how could this idea spread as something 'new' and 'better' without any clear understanding of what it is actually about?

2.3 THEORISING TRANSLATIONAL RESEARCH AS A NEW RESEARCH PARADIGM

In their book on 'Travels of ideas', organisational sociologists Barbara Czarniawska and Bernward Joerges (1996) frame new ideas as communicated

[4] See for an overview of definitions of translational blocks and phases van der Laan and Boenink 2012.

images, "which become known in the form of pictures or sounds"[5] and materialise as they are turned into objects or actions (ibid., 20). This approach provides us with insights for understanding the diffusion of the translational research terminology. Translational research is a new idea that has received its form through its communication in journal articles and policy papers and has materialised into particular research practices and organisational structures. Yet, the question is, as Czarniawska and Joerges put it, "how, at a given moment, […] individuals and groups at [a] certain place happen to notice an idea" (ibid., 22). How could translational research thus attract so much attention?

David Strang and John Meyer (1993), also organisational sociologists, highlight the analytical concept of theorisation to address specifically the question of how new ideas can attract wide-spread attention. Addressing the problem of the emergence and diffusion of new ideas, they find that these processes depend on theoretical formulations in terms of "chains of cause and effect" (Strang and Meyer 1993, 492). New ideas are theorised and presented as general models that hold the adequate solution for a general problem beyond a particular context or situation. Strang and Meyer find that such "[t]heoretical accounts of practices simplify and abstract their properties and specify and explain the outcomes they produce. Such accounts make it easier to perceive and communicate about the practice" (ibid., 497). These abstract models thus become available to anybody who perceives him- or herself as confronted with the problem that this general model is supposed to address. In the case of translational research, we can see that this practice has become theorised as the panacea for a deficit in knowledge transfer in the field of medical science. Translational research thus serves as a solution to anyone who perceives this knowledge deficit as a pressing problem.

Attention to new ideas, therefore, is acquired through the theorisation of new ideas into abstract models that can be perceived of as applicable to a particular problem by different kinds of people. Czarniawska and Joerges

[5] They highlight that words can be both, either a graphic depiction or spoken sound (Czarniawska and Joerges 1996, 20).

(1996), however, find that how these abstract models are perceived in particular local settings can differ significantly. They argue that the diffusion of such a generalized broad understanding of a new idea into ever-new contexts does not depend on any pre-given content or meaning.[6] Instead, they find that "we cannot perceive something unless it somehow relates to what we already know" (ibid., 29). Otherwise, we would not be able to recognise it. Consequently, the perception of a new idea always involves linking it to existing knowledge about the world which helps us to make sense of it. Czarniawska and Joerges give the example of different people reading the same text thereby recognising "different ideas, depending, partly, on what they expect to see, and partly on what they are able to notice in terms of categories accessible to them" (ibid., 27). What we perceive as something new and in which ways we perceive it therefore depends on previous experiences and on what we already know.

For translational research, this implies that its diffusion depends on its theorisation as an abstract model which is generally applicable to the problem of deficits in the diffusion, reception, and application of new medical knowledge. However, its meaning and how it is actually perceived depend on the social group which applies this new idea as an adequate solution to a certain kind of problem within a particular context. If we are thus interested in understanding the rise of this new paradigm we need to determine two things: who talks about translational research and what do they mean by that?

2.4 MAPPING TRANSLATIONAL RESEARCH

Many people talk about translational research in many places and in many different ways. Yet we were interested in who are the people who, first of all, perceive themselves as confronted with the challenge of applying this term to

[6] It is important to note that Czarniawska and Joerges also use the term 'translation'. However, they use it as an analytical concept for understanding the process o diffusion instead of as a particular empirical phenomenon in the field of medicine.

their everyday practices, or who explicitly make use of it for even strategic reasons and furthermore seek to share their conceptual insights and experiences with a broader community. We wanted to figure out where they come from and how they make sense of the term 'translational research'.

2.4.1 Methodology

To answer our research questions we needed to identify who is talking about translational research. We decided to draw on publications about translational research to identify the authors as the actors that shape the academic debate about this specific way of practising (bio)medical research. We thus deliberately excluded the debate in the political arena taking place in newspapers or policy documents because we were interested in actors that are confronted with this topic on the grounds of their daily work. We were aware that with a focus on academic publications we might exclude actors in professional companies or charity work that also deal with problems and solutions regarding translational research. However, we were particularly interested in the "public" debate within academia as this debate influences collective understandings that affect daily work rather than singular practices at disparate places. Yet despite these limitations, we found actors from for-profit organizations or patient foundations in our sample taking part in this debate.

We decided to search on PubMed for publications related to translational research. PubMed is a database for literature in the (bio)medical field that "comprises more than 27 million citations for biomedical literature from MEDLINE[7], life science journals, and online books" (National Center for

[7] MEDLINE (Medical Literature Analysis and Retrieval System Online) is a public bibliographic database that is provided by the U.S. American National Center for Biotechnology Information (NCBI) and contains citations for international literature of all kinds of subspecialties of medicine from about 5.600 journals (see https://www.nlm.nih.gov/pubs/factsheets/medline.html).

Biotechnology Information 2017). This database thus contains publications from all kinds of subspecialties within the medical field. These publications are sorted according to Medical Subject Headings (MeSH) that build on a vocabulary thesaurus, which is controlled by the National Library of Medicine and used for indexing articles for PubMed.

We collected all publications under the Medical Subject Heading 'translational medical research' but moreover searched for titles and abstracts including the term 'translational research' under the Medical Subject Headings 'biomedical research', 'nursing', and 'public health' in publications that were not listed under 'translational research'. In doing so, we intended to fully grasp all articles that deal explicitly with translational research without simply relying on the PubMed definition of translational research as "[t]he application of discoveries generated by laboratory research and preclinical studies to the development of clinical trials and studies in humans" and as "enhancing the adoption of best practices" as a "second area of translational research concerns" (https://meshb.nlm.nih.gov/#/record/ui?ui=D057170). We found 3,406 publications in total, from which we selected 345 publications that not only applied the terminology to a particular research endeavour, but explicitly dealt with ideas, concepts, and opinions about translational research. We then excluded from our sample publications that did not explicitly entail the terms 'translational research', 'translational science' or 'translational medicine', because we were interested in the use of this particular terminology and not in ideas somehow related to it but discussed under a different label, thus reducing the sample to 247 publications.

We then examined our sample using several analytical techniques. First, we undertook a qualitative content analysis using MAXQDA[8]. As we were interested in discovering, exploring, and then mapping the landscape of translational research, we did not work with a pre-existing set of categories. Instead, we inductively developed the code system during the coding process,

[8] MAXQDA is a software for computer-based qualitative text analysis (http://www.maxqda.com/).

which we repeated once after the development of the code system was completed. We were therefore not so much interested in quantities, but rather in qualities, mapping the variety of the specialists who write about translational research, the topics they cover and their assumptions. We then performed two cluster analyses to determine the interrelatedness of different professional domains (as demonstrated by mentions of similar topics) as well as at the interrelatedness of different topics (as mentioned by people from the same domain). We integrated these cluster analyses into a heatmap that furthermore allows for the analysis of the interrelation between topics and domains. This heatmap helped us to see how collective sense-making crosses, but also raises, disciplinary and professional boundaries.

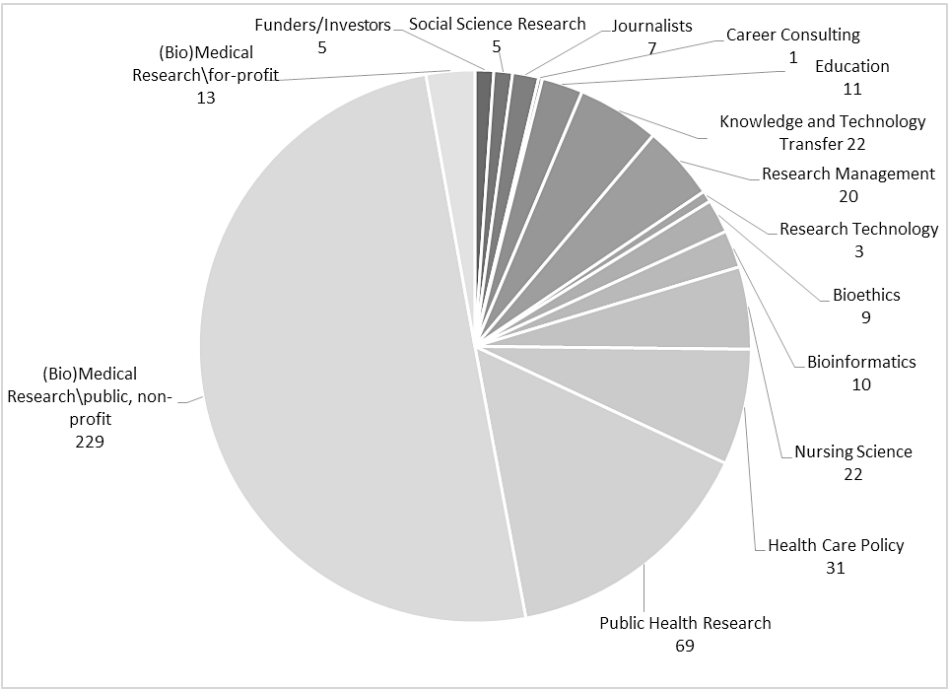
2.4.2 Who talks about translational research?

In a first step, we coded the organisational affiliations of the people, who authored the publications, to explore their professional background. As it is common practice in biomedical science to name numerous co-authors that, in many cases, have contributed little to the respective publication at hand (Singh Chawla 2015), we restricted our coding to four authors. For publications with more than four authors, we only coded the first and the last author, based on the premise that in the field of biomedical research the first author is normally responsible for the publication at hand and the last author accounts for the research project from which this publication results. When the name of the organisation did not itself indicate the author's specialty, we did a web search on the person to get additional information. When authors were affiliated with multiple organisations, we coded each organisation separately. However, if multiple authors of the same publication were also members of the same organisation we did not code this organisation more than once, as we were more interested in the multiplicity of professional backgrounds than in the number of people representing a particular institution.

We coded 545 organisational affiliations in our sample that we sorted into 15 different categories to provide an oversight about the professional backgrounds of the authors (see figure 1). The majority worked either in public

and/or non-profit biomedical and clinical research organisations, such as departments and schools at universities or (university) hospitals.[9] For-profit biomedical and clinical research organisations such as pharmaceutical companies were also present in our sample, yet to a much lesser extent.

Figure 1: Distribution of professional domains



[9] We do not distinguish between biomedical and clinical research because in the majority of the cases it was not possible to tell if people were doing basic laboratory research or rather clinical research in patients.

Besides biomedical and clinical research, we also found organisational affiliations that we could attribute to a broad range of other specialties within the field of medical science and furthermore to other professional domains outside of the medical world. Within the field of medical science, we found authors from nursing research units and organisations as well as public health and epidemiological researchers that also played a prominent role in discussing translational research. Authors located in health care policy research, in bioethics, and in bioinformatics were also represented in the sample. We furthermore found publications from authors working in research-related positions, such as those working in organisations and organisational units dealing with knowledge and technology transfer or in academic medical education. One author was even head of a consulting agency for medical career development. Translational research also appears to be a relevant topic for people affiliated with units and organisations specialising in research management, or on the provision of appropriate research technologies.

Yet translational research also appears to be an important topic for authors from outside biomedical science. Our analysis found authors with a speciality in social science research who (like us) have become interested in questions related to translational research. Authors representing foundations and potential investors also are among those demonstrating an interest in translational research, as are journalists reporting on latest developments.

The engagement of these domains reiterates that translational research raises more than internal methodological questions. Having mapped the origins and orientations of those who engage in debates about translational research, we show that there is a multiplicity of actors from different specialties and professional domains who perceive themselves as engaged with translational research and thus make use of this terminology.

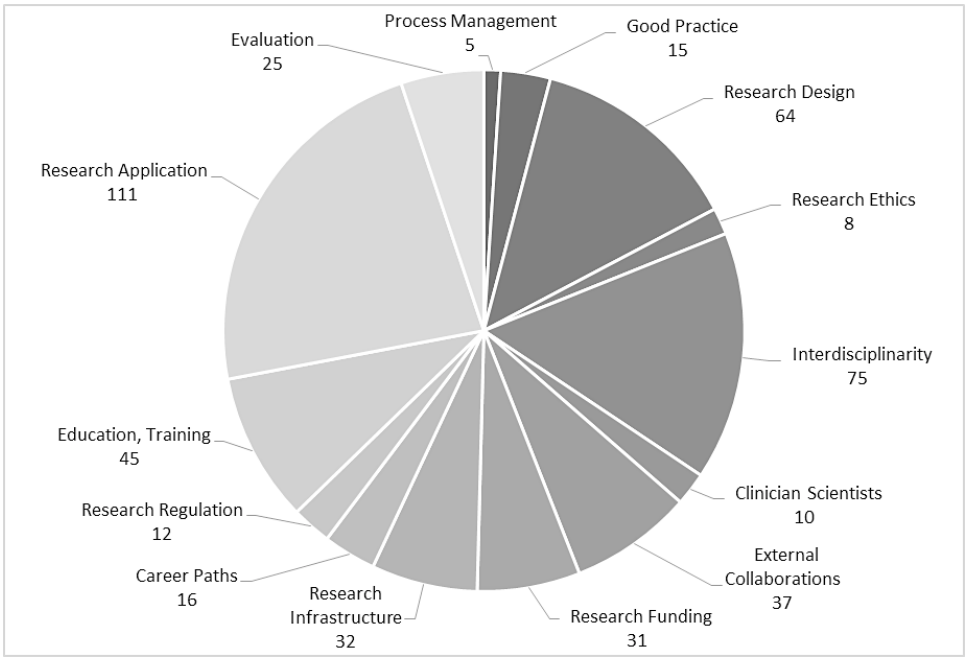
2.4.3 How is translational research theorised?

Our second step was to consider how actors address translational research and how they deal with this terminology. We therefore coded the key topics that

people discuss with reference to translational research by looking at titles, abstracts, and key words. In several cases, we needed to look more closely into the entire publication when abstracts were missing, or titles and keywords yielded too little insight about the actual content. Each publication could have more than one topic. The array of topics covered gave us insight into how actors make sense of translational research and into the meaning they attribute to it.

We coded 562 topics in our sample and found 14 different key categories, with 16 subcategories that deal with problems and solutions that the authors discuss as critical either when practising translational research or when translational research is missing (see figure 2). We clustered these topics into five main categories: 1) external conditions for translational research, 2) preconditions for translational research, 3) translational research organisation, 4) translational research practice, and 5) translational research aims. We furthermore found as a sixth category 'evaluation' that traverses some of the aforementioned categories in that it addresses their evaluation. Together these categories describe the terms actors use to talk about translational research, their descriptions of implementation, or their discussions of changes and improvements that are necessary for or that result from translational research. We were thus able to see how people perceive of translational research as a solution to a particular problem or even as problematic in itself.

Figure 2: Distribution of mentioned topics



Actors mentioned translational research as based on a necessary improvement of external conditions. They discussed, in particular, more translational research funding, infrastructure, changes in administrative regulations, and the development of fitting career paths as necessary conditions for conducting translational research. In terms of funding, either actors emphasised that translational research needs more funding and different funding schemes, such as public-private partnerships, which were often mentioned as a possible way of collaboration with external partners, or they highlighted how the ways of funding have already been changing due to this new paradigm. Translational research thus generates the problem that for this particular kind of research endeavour novel ways of funding are needed. Yet at the same time, the translational research terminology is seen as a possible solution to the constant

lack of money in medical science, because it points towards new resources, collaborations, and funding schemes. Talking about infrastructure is another way of making sense of translational research. The provision of infrastructure e.g. such as shared biobanks that can be worked with across disciplinary boundaries underlines the interdisciplinary efforts that are understood as a prerequisite for translational research. The handling of huge sets of data is another way that infrastructure is addressed, which gives insights into the understanding of translational research as data-driven research. In addition, "infrastructure" is often framed by actors in a much broader sense, meaning the provision of general resources and services to support research. In general, actors understanding translational research as a question of infrastructure demonstrate that translational research is regarded as a way to conduct more effective and efficient research. Research regulations are another topic that relates to debates about research efficiency, either in that regulations restrict research or in that better knowledge about existing regulations, as well as competences to handle them, are needed. Translational research thus seems to be the appropriate arena for discussing research regulations as a pertinent problem to medical science in general. Finally, the issue of career paths is directly linked to translational research, demonstrating that doing translational research affects questions of personnel development and the blurring of disciplinary boundaries. Specifically, the works we examined often questioned who is actually capable of doing translational research, as well as what the consequences are for academic careers when pursuing this kind of research.

The question of blurring disciplinary boundaries is also frequently addressed as a precondition for translational research. Appropriate education and training are mentioned as indispensable, as translational research is understood as necessarily based on knowledge in more than one specialty and, thus, on training people who can do interdisciplinary research. In many cases, this means improving methodological skills and basic science knowledge, but it also requires better knowledge about clinical practice. This is also related to discussions about the organisation of translational research. Actors emphasise that building interdisciplinary teams is a cornerstone of translational research, and likewise stress the role of clinician scientists working at the boundaries

between biomedical and clinical research. Providing specific knowledge and a new professional structure are thus understood as the basic prerequisites for translational research. Moreover, the call for interdisciplinarity and teamwork is pushed even further into the direction of external cooperation. As already mentioned, public-private partnerships between public research and industry are not only understood as an additional source of funding, but as a better way of doing research. The authors in our sample, however, also mention other potential partners, such as social scientists and humanities scholars, and beyond academia, health professionals, patients, or other social groups to develop appropriate research questions. Translational research is thus understood as fundamentally grounded in crossing disciplinary and professional borders integrating even extra-academic knowledge into medical research.

Translational research is not only understood as a new way of organising research, but also as a new way of practising it. In between these two aspects of translational research lies research process management. This issue focuses on the question of how to organise the research process, while also addressing translational research practice, as this entails ideas about research procedure. Research design is considered to be another issue of translational research practice. The articles we examined discuss new theoretical or methodological approaches that are thought of as bridging disciplinary divides through new research questions and approaches. In addition, the understanding of the translation process and the direction it takes are described as non-linear, or as a two-way street. Practising translational research is furthermore discussed as based on good scientific practice that involves, in particular, the adherence to proper criteria for data collection, management, and interpretation. As another dimension of translational research practice some authors mention research ethics. Ethical questions are thereby regarded as either necessarily guiding practical concerns such as trial design and the selection of patients or rather as an obstacle to pursuing innovative approaches that expand into new territories e.g. such as stem cell research. Making sense of translational research by turning its claims into practice thus challenges common routines of scientific thinking and practice.

The authors in our sample also articulate their ideas about the aims of translational research and, in particular, about research applications. This is a crucial question because it directly addresses the core issue of translational research's actual purpose. In these articles we found a broad range of different aims. On the one hand, many of these reflected the dominant understanding of translation as the application of new knowledge into clinical trials and new medical interventions. On the other hand, authors discussed translation into routine practice, in terms of available treatments and care in hospitals and primary care. Some authors described the patient as the recipient of new medical knowledge, while others argue that translational research should deliver ideas for health care policy. Prevention is mentioned as another goal that translational research should aim for. Yet translation is also considered as working the other way round, introducing new insights from everyday practice into further (bio)medical research. The multiplicity of aims discussed as the destination for the application of new knowledge in the process of translational research demonstrates the broad range of different understandings about where translational research takes place, who is involved and therefore how it should look like.

Evaluation is a topic that extends into the different dimensions of translational research, which we have mentioned above. As infrastructure is regarded to be a crucial condition for doing translational research, it is regarded as needing evaluation. In addition, the results of translational research and their application should be supervised and evaluated. Yet, the entire idea of translational research is mentioned as subject to evaluation. Translational research as the promised solution for a collectively perceived deficit in knowledge transfer thus apparently implies the constant supervision of its actual efficiency and effectiveness.

The mapping of the meanings attributed to translational research has thus presented a kaleidoscope of different dimensions that reflect the understanding and application of this terminology. We found that even though people address similar topics and issues, how they make sense of it differs significantly from each other. We thus see a diverse landscape of meaning invoked when actors attempt to make sense of this terminology. This finding emphasises that actors

with different perceptions of problems and solutions all have their particular claims in the debate about what translational research actually is about.

2.4.4 The challenge of translational research

In addition to showing, first, who talks about translational research and, second, how translational research is addressed, we were interested in which professional domains promote which kind of understandings of translational research. We, therefore, set out to observe which topics are jointly mentioned in the publications and see how different professional domains are linked based on their interests in similar topics. The clustering of topics and professional domains helped us to map the multiple meanings of translational research in more detail. In order to achieve this, we constructed a heatmap that allows for both detecting patterns within topics and within domains, as well as the interrelation between the two (see figure 3).[10] The shade of each cell, furthermore, represents the level of relevance in a column-wise fashion, i.e. the higher the amount of relative mentions for a topic within the domain, the darker the shade of the respective cell. To allow for a more refined interpretation we also included vertical lines that represent the numeric extent to which a topic was being judged as relevant within a domain.[11]

To better understand the relation between domains and topics we conducted cluster analyses within each dimension and used this information to re-arrange the order of labels of the heatmap according to their relatedness.[12] Domains are clustered together if similar topics are being interpreted as

[10] The number of mentions was then normalized, i.e. the mentions for each domain were recalculated in such a way that they comprise a 'portfolio' of relevant topics within this domain. The maximum for each column represents the highest number of domain representations. All other values were recalculated as shares of this maximum value.

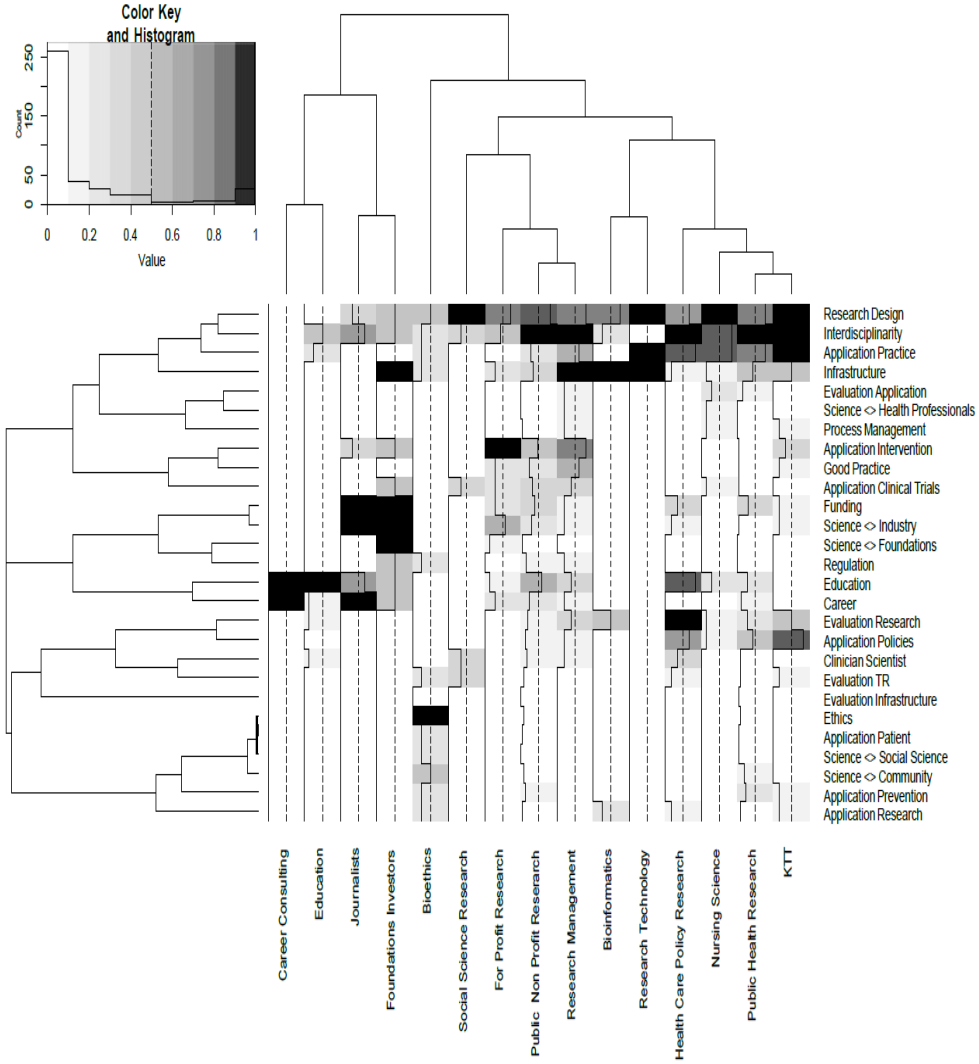
[11] Both cell shades and vertical lines show the same information.

[12] In order to account for differences in respondents for each domain, the distance matrix calculation prior to the cluster analyses were based on cosine distances.

relevant, and consequently, topics are clustered together by mutual appraisal within domains. This allows for an interpretation that connects both dimensions by identifying blocks of topics and domains that are closely related together. These blocks allow for a holistic interpretation of the landscape of meanings of translational research. Furthermore, it allows for identification of topics that are widespread versus topics that are rather sparsely recognized as relevant.

Our results are certainly limited to the extend that not everybody in each domain mentions the same issues as a dominant topic and that people furthermore talk about many more topics than what appears as dominant in their titles and abstracts. Hence, there is still space for further research.

Figure 3: Heatmap of topics and professional domains



We found that nearly every professional domain discussed research design as the introduction of new methodological and theoretical ideas jointly with interdisciplinarity as working across disciplinary borders. These two topics are also linked with the aim to apply research results to medical practice. These three topics are what people across different domains basically refer to as translational research.

However, there are topics that link only particular domains with each other. These clusters thus demonstrate different stakes in the understanding of translational research and show the boundaries between, in particular, research based domains. For-profit and non-profit (bio)medical researchers jointly with research managers, who provide administrative support to researchers, shared a focus on the application of new knowledge into clinical trials and medical interventions and therapies which they mention in relation with the claim for good research practice. They also refer to questions of education and career development. Research managers hence apparently not only care about a fluent research process but also about quality standards in research as well. Furthermore, they all address funding and co-operation between science and industry. Thus, not only research managers, but also people who are practising (bio)medical research, perceive translational research as related to the problem of sufficient funding, which can be boosted through developing relationships with the pharmaceutical industry. However, external funding was perceived as both, a benefit for better research conditions as well as a problem for scientific freedom.

Foundations and commercial investors are linked with journalists through similarly mentioning the topic clusters education and career as well as funding and science-industry co-operation jointly with an interest in research application into interventions. Such an understanding of translational research might not be surprising in the case of potential funders. That journalists share a similar understanding, however, demonstrates that the issues of funding and of education and career are perceived as particularly crucial problems that not only concern the inner community, but need further reporting to a wider public.

We can furthermore observe a cluster of professional domains that includes health care policy research, nursing science, public health research, and

knowledge and technology transfer (KTT). These disciplines are linked, in particular, through their reference to research evaluation and the application of research into policies. These domains thus have a similar understanding of translational research in that they recognise the aim of translational research beyond the application of research outcomes into practice, but going further to have an impact on health care politics. The evaluation of research therefore contributes to the development of evidence-based practice guidelines and policies. Actors who work on the provision of adequate research technology such as databases, meanwhile, are linked with the domain of bioinformatics, advancing these databases and the tools for data analysis. They share a common understanding about the necessity of an adequate infrastructure for doing translational research.

An especially interesting case is the discipline of bioethics, which has a quite isolated standing in this discursive field. It is the only one to interpret translational research as a problem of research ethics. The perspective on ethics is furthermore linked with a specific clustering of topics that comprises, on the one hand, co-operation with the humanities and social sciences as well as with the community level and, on the other hand, the application of research on the patient, into measures of prevention, or back into further research. Translational research is discussed in terms of research application as an ethical problem. Yet it is not the application into clinical trials or medical interventions, which serves as the dominant topic. Instead, the patient and the prevention of illnesses are mentioned as the aims of translational research. It is thus not a medical 'product' but rather sick people or even the health of the entire community that are kept in mind when talking about application. Also, the application of new insights back into research addresses the need of bringing 'real-world' problems to (bio)medical research. This is similarly expressed through mentioning co-operations between science and community.[13]

[13] We furthermore found that social scientists care about the evaluation of the translational research concept and its meaning as we do here in this article.

To summarise, then, we have found that the clusters of topics and domains and their interrelatedness reveal how translational research, as a particular way of doing research in medical science, challenges the medical profession. They show how collective sense-making crosses, but also raises, disciplinary and professional boundaries. Our analysis furthermore reveals shifts in the understanding of what medical science is actually about. It shows that actors from different specialties, disciplines, and professions claim their stake in medical knowledge production by defining what translational research is about and where it takes place ranging from biomedical laboratory research and clinical trials to evidence-based practice development and public health research.

2.5 CONCLUSION

This study shows that many groups from different specialties and professional domains use the term translational research, but discuss it in many different ways. Thus, on the one hand, we could show that the diffusion of the translational research terminology has been successful because translational research is an abstract model that is – as Meyer and Strang have conceptualized it – generally applicable to the commonly shared problem of deficits in the diffusion, reception, and application of new knowledge. Yet, on the other hand, its wide diffusion and adoption takes place because – as Czarniawska and Joerges have shown – different groups of actors, from different contexts and settings, are able to make sense of this paradigm by applying it to their own particular definition of specific problems and solutions. While there are some commonly shared characteristics, such as interdisciplinarity and a new research design, there is a multiplicity of topics that actors also relate to when talking about translational research.

Based on these references, we found five distinct perspectives on translational research that are related, in particular, to different research based professional domains. (Bio)Medical researchers, no matter if for-profit or non-profit, understand translation as developing new interventions based on

standards of good research practice while depending on proper education and on funding also in terms of public-private partnerships. The domains of health care policy research, nursing science, public health research, and knowledge and technology transfer share a perspective on translation as based on research evaluation in order to translate new insights into health care politics. Bioinformatics make a claim about technological infrastructure research as indispensable knowledge for practising translation. Finally, the domain of bioethics highlights an ethical perspective that displays in a focus on the translation of new research results into better health care for patients and the community as such and in a search for co-operations beyond the field of medical science.

These specific constellations of professional domains that are linked, through a similar understanding of translational research, can furthermore provide insights into the challenge of medical science through the rise of this new terminology. We have shown that this debate is far from being simply a discussion about research (pre)conditions, organisation, practices, aims, and evaluation. Rather it actually challenges what medical science is about. It is, therefore, not only the multiplicity of underlying understandings of translational research which provides a challenge to the field of medical science. It is furthermore the participation of many different stakeholders, who make their claim about their understanding of translational research and thus about their role in medical knowledge production, that challenges the understanding of medical science as such. Medical science, therefore, takes place not only in the clinic and is not only practiced by physicians. It is also not only challenged by the biomedical sector. Additionally, there are much more specialties and professional domains e.g. such as nursing science, public health research, or bioinformatics who make their claim about their participation in medical science by introducing their topics and therefore their understanding of the production, translation, and adoption of medical knowledge and its impact on human health.

These findings certainly need further research. However, they provide first insights into the multiple meanings of translational research and how this rising paradigm challenges medical science. The debate about translational research

therefore is an ongoing negotiation about what medical science actually is and where it takes place.

3 WHAT ARE CLINICIAN SCIENTISTS EXPECTED TO DO? THE UNDEFINED SPACE FOR PROFESSIONALIZABLE WORK IN TRANSLATIONAL BIOMEDICINE

3.1 ABSTRACT[14]

Clinician scientists have gained institutional support in the era of translational research, as the key solution to closing the 'translational gap' between biomedical research and medical practice. However, clinician scientists remain an 'endangered species' in search of a secure niche, while new grants and training programs attempt to counteract their measurable decline in numbers over the past decades. Our study asks how an occupational space for clinician scientists is currently situated between the politics of translation, professional dynamics, and the specialization of academic disciplines. We interviewed clinician scientists, their adjacent professions—clinicians and biomedical researcher—, and contrast their views with expectations from the discourse on clinician scientists in the biomedical and policy literature. We identify professionalizable work and tasks that relate to, first, being able to speak the two languages of both clinic and research, second, translating patients' needs and clinical experience for further research, and third, counteracting the trends towards specialization by providing an inclusive point of view. We find that clinician scientists are overburdened with fulfilling a hybrid role of simultaneously being clinicians and scientists. Based on these findings, we suggest a path for the future professional development of clinician scientists towards the role of a translator.

[14] Dieses Kapitel ist eine Preprint-Fassung des veröffentlichten und zitierbaren Beitrages: Hendriks, Barbara; Simons, Arno; Reinhart, Martin (2019): „What are clinician scientists expected to do? The undefined space for professionalizable work in translational biomedicine". In: Minerva 57 (2): S. 219-237. Doi: 10.1007/s11024-019-09367-4.

3.2 INTRODUCTION

Medical professionals who occupy a role between clinic and research have been called 'clinical scientists', 'physician scientists', or 'translational scientists', with definitions and expectations of their work changing considerably over time (Schafer 2009; Rosen 2011). Most recently, 'clinician scientist' has become the preferred label, although multiple views coexist of who and what the clinician scientist is and should be. In general, authors agree that a clinician scientist holds a degree in medicine while somehow being engaged in biomedical research. However, "there is the argument of whether a physician-scientist is an MD or an MD-PhD who does research, whether that research can be basic or "translational", and/or whether it should be clinical or at least clinically impacting" (Rosen 2011, 63). The occupational role of clinician scientists and whether their primary work should relate to research, clinical practice, or care remains a contested issue. What seems uncontroversial, however, is that clinician scientists are expected to be situated at the institutional boundary between the clinic and the lab, standing with one foot in either world.

It comes as no surprise, then, that clinician scientists have positioned themselves as a key organizational fix (Wilson-Kovacs and Hauskeller 2012; Vignola-Gagné 2014) to the widely-discussed problem of (bio)medical translation, i.e. the challenge of translating knowledge from bench to bedside and back (Marincola 2003; Butler 2008; Macleod et al. 2014; Milewicz et al. 2015; Fudge et al. 2016). Clinician scientists, the claim goes, personify the missing link between laboratory and clinical practice and are therefore instrumental in crossing the metaphorical "valley of death" (Butler 2008). In this context, numerous programs that promote and train clinician scientists have been established in countries around the world, e.g. in the USA, Canada, the UK, Germany, Japan, and many more. These programs face two connected challenges: On the one hand, the occupational role of clinician scientists is equivocal and, as a practical consequence, the necessary skills to be acquired remain nondistinctive. On the other hand, translation as a problem to be fixed entails even more controversy, bringing the risk that expectations for clinician scientists are at whim of a highly political and volatile issue. While it seems clear from the existing literature that clinician scientists are in high demand without

having a clear occupational identity, only few studies reflect actual needs of clinician scientists (Taylor 1992; Ley and Rosenberg 2002; Lander et al. 2010). What is missing, so far, is empirical work that not only asks those identifying as clinician scientists about their work and their daily challenges in being expected to bridge the gap between bench and bedside but also lets clinician scientists reflect on what would improve their situation.

Our study combines qualitative and quantitative data from interviews with clinician scientists, clinicians and biomedical scientists (n=78), as well as a discourse analysis of the biomedical literature on the subject (research articles and policy papers, n=253), the latter includes work that discusses the clinician scientist role for translational research (see e.g. Lander et al. 2010, Roberts et al. 2012, Lemoine 2008). The study is theoretically framed by Andrew Abbott`s theoretical vocabulary, developed from the sociology of professions (Abbott 1988; 2005; 2016). We find that although clinician scientists are partially able to meet the various and vague expectations in their day-to-day working practice, they often feel torn between these expectations. Their specific occupational tasks relate to, first, being able to speak the two languages of both clinic and research, second, to translate patients' needs and clinical experience for further research, and third, to counteract the trends towards specialization by providing an inclusive point of view. Even though these tasks are mostly in line with the general expectations, they require further organizational measures to support exclusive jurisdictional claims for clinician scientists. We use these findings to discuss how a translational ecology centered around clinician scientists could look like and suggest that the professional role of clinician scientists would benefit from being conceptualized as translators between bench and bedside instead of being both, clinicians and scientists.

3.3 HISTORICAL CONTEXT

The general idea of physicians doing research can be traced back to the middle ages (Schafer 2009, 24), while the first public problematization, that has some current relevance, dates to 1909 from Samuel Meltzer, president of the Association of the Advancement of Clinical Research (now the American Society for Clinical Investigation) (Daye et al. 2015). Meltzer recognized the increasing internal differentiation of medicine, mainly caused by the development of scientific methods and the growth of knowledge (Meltzer 1909, 508). This trend continued over the next decades and "biomedical research emerged as a discipline in its own right, with its own training" (Butler 2008, 841). As a result, the number of clinicians active in research decreased tremendously from the 1970s onwards to the present.

Now, to counteract the declining number of clinician scientists, the establishment of training and funding programs has become a major attempt to organize translational research. The underlying idea of these training and funding programs is to raise the number of hybrid professional identities able to bridge the gap between biomedical research and clinical practice. Despite the attention and support, a lack of standardization of these training and funding programs is noticeable (Westfall et al. 2007). A diverse set of training programs can be found around the world: The National Institutes of Health in the US created various clinician scientist training and funding programs to support "individuals proposing a career in clinical research" (https://www.nibib.nih.gov/training-careers/clinician-scientist) and the Canadian Institutes of Health Research (CIHR) launched a "Clinician Scientist Award" (http://www.cihr-irsc.gc.ca/e/44221.html) to promote clinician scientists. More recently, in 2016, the German Research Council (Deutscher Wissenschaftsrat) recommended that five to eight percent of physicians in Germany should be qualified as clinician scientists (Wissenschaftsrat 2016). Numerous universities and university hospitals provide training and funding programs—such as Harvard Medical School, the University of Toronto, or the university hospital Charité Berlin (Blümel et al. 2015). Despite their organizational differences, especially regarding the working conditions of clinical practice and research time and the financial support for research time,

all these programs share a common aim: to support a professional role that links biomedical research with medical practice qua persona, i.e. by allocating individual working time to both research and clinical practice.

In short, the increasing establishment of various, non-standardized, clinician scientist programs has not lead to a common understanding of how to perform the role of a clinician scientist. Judging from the history of medicine and biomedical research, the role of clinician scientists is understood to fill an only loosely defined occupational space for which no template of an independent profession exists.

3.4 PROFESSIONALIZATION IN BIOMEDICAL AND TRANSLATIONAL RESEARCH

The sociology of professions provides a wide range of theoretical approaches addressing professional occupation and work in the biomedical and medical domain. In general, key features of professionalization can be defined as expertise and knowledge to perform professional jurisdictions (Freidson 2004; Timmermans 2008) or as the ability to reconstitute professional expertise and to reconfigure professional boundaries (Fournier 2000; Xyrichis et al. 2017). The development of professions is promoted by brokering knowledge (Kellogg 2014) and can result in processes like diversification and specialization (Nancarrow and Borthwick 2005). Furthermore, the interdisciplinary and/or disciplinary identity (Calvert 2010) as well as the forms of intra-professional struggles (Brosnan 2017) are of special interest in understanding professions in the biomedical and medical workforce.

The professionalization of clinician scientists has been discussed to mechanisms of professional empowerment in relation to political initiatives. It has been shown that clinician scientists gained professional power from political initiatives in biomedical research and translational research. Wilson-Kovacs and Hauskeller (2012, 497) find that the clinical implementation of stem cell research provided a new platform for the professional legitimization of clinician scientists. The study from Vignola-Gagné (2014, 94) shows that

clinician scientists gained professional power by claiming their role as leaders for translational research initiatives. Other authors have discussed how different educational settings of medicine and science influence professionalization of clinician scientist roles (Kluijtmans et al. 2017) and elaborated dimensions in clinician scientists training and funding programs that might support identity development (Rosenblum et al. 2016).

In line with these theoretical and empirical notions our focus lies on 'occupational battles' between the two professions while deliberately considering the political context. Biomedical research is undergoing changes due to attempts of re-bridging biomedical research and clinical practice (Ioannidis 2004). Clinician scientists are linked to these attempts since they are perceived as pivotal figures for translation. Professionalization thus becomes a matter of occupational battles between medicine and science, driven by a political discourse setting a new research agenda for biomedical and medical research.

3.5 EXPLORING PROFESSIONALIZABLE WORK IN DIFFERENT ECOLOGIES

We find clinician scientists in a complex setting. On the one hand, they are entrenched between two professions, medicine and research, and between two scientific disciplines, biology and medicine. On the other hand, they figure prominently in the political discourse on translation in biomedical research (see e.g. Butler 2008). To describe and analyze such a setting, Abbott's theoretical vocabulary, developed from the sociology of professions (Abbott 1988), provides an ideal resource as it allows for relating professional, academic, and political issues (Abbott 2005). Whether clinician scientists should be seen as an emerging profession, an emerging discipline, or as a political issue, is not yet clear. What is clear, however, is that they are linked to the three ecologies central in Abbott`s approach: professions, academia, and politics (Abbott 2016, 39).

Whereas the clinic links clinicians with patient care and science links scientists with research, clinician scientists have no clear and exclusive links to specific tasks and thus do not constitute an equivalent profession. For clinician scientists to become a profession between research and medicine would mean to be able to link themselves to a set of controlled tasks in simultaneous competition with clinicians and scientists. For actors to establish themselves firmly in one ecology requires them to be successful in at least one further ecology. To be successful as a profession or an occupation, clinician scientists need support from success either in academia or in politics. Their strongest location in the academic ecology is in educational training programs that are strongly supported by university hospitals and by funders. In the political ecology they feature strongly in the discourse on translation and their work is linked to enacting the changes envisioned in the discourse. In Abbott's terminology the level of success in each ecology can be described as follows: the clinician scientists are a historically recurring political "bundle", a newly established "settlement" in academia through training programs, but lack a clear professional "jurisdiction" (Abbott 2016, 40). Professional jurisdiction is the most difficult to achieve and there seems to be no open space between clinic and research where clinician scientists could claim tasks to control exclusively. Yet, the discourse on translation construes an arena of "potentially professionalizable work that [is] currently constituted under loose, common-sense understandings, as was 'getting dotty' before it became 'senile dementia', 'organic brain syndrome', and eventually 'Alzheimer's disease'" (Abbott 2016, 40).

Translation itself is too loose a concept to constitute professionalizable work, however, it is open enough to work as a "bundle" in the political ecology. It may thus be possible to connect translation in the political ecology to a jurisdiction of a set of controlled tasks in the professional ecology, so that this link provides rewards in both ecologies, what Abbott calls "hinges" (2016, 49). In relation to the academic ecology the situation is similar: Clinician scientists are firmly linked to training programs but these programs do not constitute a set of controlled tasks in the professional ecology. Training programs cover more tasks than could be controlled professionally by clinician scientists,

because, in principle, these programs cover all the tasks that medicine and research combined already control. Both hinges between professions and politics and between professions and academia require a set of tasks that clinician scientists would control professionally, and it is these types of tasks that our analysis will primarily look for. They will, preferentially, be part of the discourse on translation or of training programs and they are not part of what doctors and researchers already control exclusively.

The long history of the clinician scientist shows that there is a zone of specific ecological nature that may allow for establishing clinician scientists as a profession. Mainly through the political bundle of translation an arena has been opened between medicine and research and, so far, the clinician scientist has been positioned in this arena as an "avatar" (Abbott 2016, 70), faced with the problem of resisting different pressures from different ecologies. The "avatar problem" will only be solved, when a set of professionally controllable tasks for clinician scientists can be found despite of what can become part of this set may be unexpected and may look randomly assembled at first. To answer the question of how professionalizable work is achieved, e.g. how hinges are practically arranged to form a new ecology, our study proceeds twofold: First, we explore the expectations towards clinician scientists in the discourse on translational research in order to find possible hinges between ecologies. Second, Abbott sees professionalizable work as something over which actors from different professional ecologies compete (Abbott 2005, 251). We thus ask those actors—clinicians, scientists, and clinician scientists—what practice they see as translational. From their views, challenged and unchallenged translational practices can be inferred and discussed as to whether these may form a separate translational ecology.

3.6 METHODS

To map existing expectations towards the clinician scientist role, we take a dual perspective. First, we analyze expectations formulated in the policy and academic literature. This discourse analysis (Gee 2014) is based on selected

policy papers from the US, Canada, UK and Germany and a literature sample retrieved form the biomedical research database PubMed (n=253) in December 2015 (see table 5 and 6 in the appendix). Our literature sample contains research articles addressing the clinician scientist as profession or occupation, the oldest of which dates to 1937—a paper titled "The Physician: Scientist or Artist?" However, we limited our analysis to articles published since 2005 (n=148)—a time when publication activities in translational research consolidated in the journal landscape (Blümel et al. 2015, 28). The aim was to find out which kind of expectations are raised and at which levels of abstraction. The focus in our discourse analysis thus lies primarily on the variance of formulated expectations and descriptions regarding the clinician scientist positions (see table 7 in the appendix).

Second, we use semi-structured interviews together with a card sorting task (Stephenson 1993) to find out what expectations clinician scientists have of themselves and feel exposed to. We surveyed clinician scientists in specific training programs (n=19) lasting over several years as well as clinicians and biomedical researchers (n=59) in 2016/17. The interviews with clinicians and biomedical researchers were specifically analyzed for statements and expectations concerning the clinician scientist role. We interviewed individuals employed in a German biomedical research institution and a university hospital, both implementing translational research as a new biomedical research framework.

The interview situation consisted of two parts. First, we asked the interviewees to rank a fixed set of organizational measures and approaches (n = 53, see table 4 in the appendix) according to their importance for translational research. The ranking grid was designed to mimic a normal distribution. This approach provided insights into organizational needs of clinician scientists, clinicians and biomedical researcher to maneuver their positions more successfully in the context of translational research. This ranking task formed part of a larger project employing Q methodology (Watts and Stenner 2012). Q methodology aims to explore opinions and attitudes, to reveal and to understand the predominant viewpoints within a group regarding a topic of interest, i.e. how people think about a specific topic, such as translational

research. For the analysis here, we used only those measures that were perceived as most beneficial for translational research (statements that were most highly ranked). We compared the ten most frequent measures evaluated by clinician scientists (see table 2) with those by clinicians and biomedical researcher (see table 3). For the second part of the interview, we asked the interviewees to explain their choices and to elaborate more on the role and the needs of clinician scientists with the help of a semi-structured interview. The semi-structured interviews were transcribed and a qualitative content analysis was performed using the software package MAXQDA. Interviews ranged from about 1.5 to 2 hours in duration. We focus our analysis on interview passages that were coded with codes relating to the situatedness of the clinician scientist role (73 codings), challenges and needs regarding the clinician scientist role (129 codings), advantages and disadvantages of the clinician scientist program (56 codings), meanings and insights of how to improve translational research (222 codings), important aspects regarding translational research (50 codings) and factors hindering translation (6 codings). The number of codings correspond to how many text passages from the interview material were coded with a specific category.

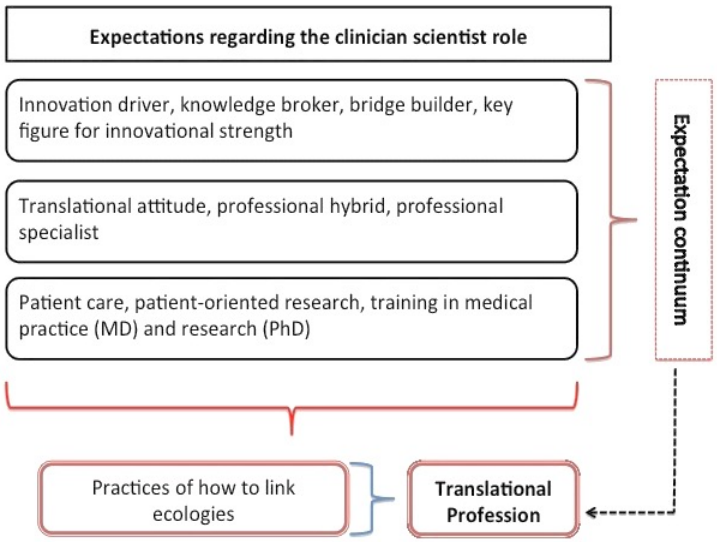
We use these two methods—discourse analyisis and Q methodological interviews—to counteract the extpectations others have of clinician scientists with the expectations clinician scientists have of themselves.

3.7 EXPECTATIONS WITHIN THE DISCOURSE: HOW TO BUILD A TRANSLATIONAL PROFESSION?

Clinician scientists are in need of professionalizable work, but what the specific tasks are that allow for building a professional identity is an open question. In general, we can find such professional tasks in the formulation of expectations of how to fulfill a specific role or position. Hence, in order to find out how clinician scientists are expected to link ecologies, we analyzed key terms and phrases within the research and policy literature and categorized these terms and phrases according to their continuum of expectation (higher – lower, see

table 7 in appendix). Our guiding assumption was that the more abstract and unspecified expectations are formulated in the documents, the less they lend themselves to orient actual practices of linking research and clinic. This specific analysis thus should reveal what kind of practical information are given to the individuals to perform the role of a clinician scientist (see figure 4).

Figure 4: Expectations of how to link ecologies in the clinician scientist profession



At a high level of abstraction, mostly represented by policy papers, the clinician scientist is vaguely defined as a driving force for national innovation. Key terms and phrases at this level do not contain any specific advice of how to practice translation.

The overall role of such policy papers seems to be the justification of the national need for clinician scientists. The clinician scientist is described as an innovation driver and key figure for the preservation of national innovational strength. As such, the clinician scientist is perceived as an important

counterpart to technology development and basic science. At the same time, a key responsibility for the life sciences as a whole is ascribed to the clinician scientist role. With its unique position, the clinician scientist is imagined as a knowledge broker and bridge builder, who instigates the field of biomedical research and thus becomes a guarantor for the connection between pure science and clinical science in the overall life sciences (see in particular DFG 2015 and e.g. also Lockyer et al. 2014).

At a medium level of abstraction, mostly represented by the biomedical and medical research literature, key terms and phrases deal primarily with hints of how a hybrid profession should be constituted by defining attributes of a so-called translational profession. Overall, this kind of literature tends to avoid the type of general catchwords and phrases that we found in the policy literature. Instead, we prominently find descriptions addressing the cultivation of a professional hybrid by emphasizing the translational attitude of clinician scientists. With its requested translational attitude the clinician scientist is said to become a pivotal figure for translational procedures that means the opportunity to work in interdisciplinary research teams and to build practical connections between people from the highly specialized fields of research and clinical practice.

We identified the lowest level of abstraction especially in recommendations for clinician scientist training and funding programs, containing at least some practical descriptions of how to combine clinical practice and (pre)clinical research. Such recommendations demand, for example, that clinician scientists should be trained and work as both good scientists (producing knowledge, publish research findings and attract research funding) and good clinicians (doing patient care, improving patient health). This implies that clinician scientists should hold both a PhD and an MD. Even at this lower level, the specification of the clinician scientist role and how it could practically link ecologies remains rather vague.

In none of the literature types analyzed do we find specific hints of how to practice translation other than that translation should be practiced by somehow linking ecologies. Whenever the clinician scientist role is described in some more detail, such descriptions boil down to descriptions of the already

established professional roles of the biomedical researcher working at the bench and the clinician working at the bedside, implying that clinician scientists should embody both these existing roles. The only addition that is made concerns the claim that clinician scientists should use their two hats, as researchers and clinicians, to translate findings and practices from bench to bedside and back. We therefore conclude that the existing discourse fails to offer practical guidance not just for the professionalization of clinician scientists but even for a basic occupational identity because it lacks descriptions of the clinician scientist role that goes beyond already existing professional roles.

3.8 TRANSLATIONAL TASKS

Despite the fact that the professional role of clinician scientists is highly underspecified in the literature, there are clinician scientists working in professional settings and putting into practice what it means to be a clinician scientist. How do people trained as clinician scientists see their own professional role? What are the tasks of clinician scientists, especially where these tasks relate to translation? We now present findings from our interviews addressing these questions.

3.8.1 Taking patients' needs and problems to the laboratory bench

Patient care and improving patient's health are central medical tasks and the act of healing constitutes a pivotal jurisdiction to the medical profession (Freidson 1988, 3 ff.). The biomedical research profession, on the contrary, is mostly excluded from these tasks and jurisdictions. Performing research and treating patients are generally attributed to two different professions: clinicians and scientists. Translating health issues from the bedside to inform research questions in the laboratory, however, can be described as a unique task for clinician scientists.

> "I became interested in research when I was working at the bench. Dealing with patients [with chronic diseases] made us take a step back and say: How can we model that [disease] in the lab? How can we produce diseases in animal experiments? And so we did it in animal experiments and are trying now to find out how such [chronic] deficits can happen to those seriously ill patients" (clinician scientist, b10).

As a hinge between the medical and the research ecology, individual patients' health and the doctor-patient-relationship are translated into research questions, then into testable hypotheses, and ideally into an experiment in a mouse or tumor model. Combining research and medical tasks thus result in a form of applied research that is directed to the patient's health needs and problems and thus address the notion of translation.

> "I guess that makes sense, because a clinician, who is science-oriented and tries to take problems into the lab and to develop new things from that, well, this kind of person is extremely important in that context [of translation]" (clinician scientist, a25).

> "Okay [there is] clinical research to healthy and/or sick people and translation to preclinical research. That seems easy to handle for me. Verifying issues with tumor materials or something like that, which I study on patients, and then to validate my hypothesis or to look what kind of pathogenesis stands behind that issue" (clinician scientist, a25).

3.8.2 Clinician Scientists as intra- and inter-professional translators

A key moment distinguishing clinician scientists from pure clinicians and scientists is that they simultaneously function as intra- and inter-professional translators. On the one hand, clinician scientists describe themselves as translators between different 'languages' within a research environment that is becoming more and more interdisciplinary. Those different languages result from different perspectives and understandings by actors from distinct disciplines. Clinician scientists thus constitute an interface between distinct disciplinary environments and contribute to a more common understanding between different perspectives in the biomedical environment.

> "Actually interdisciplinarity reaches limits. This is why we need that clinician scientist program. They need people who understand both. One shouldn`t underestimate that. I have experienced this again and again, really, that people asked me: Could you help me there, we have a partner, and we do not understand what they did, and they don't understand us either, like not at all. Really astonishing" (clinician scientist, a22).

> "It is extremely important to link persons from bench and bedside and that there is a mutual understanding between them. I believe that both groups have their own talents and insights, and that they can benefit from each other. I believe that the basic scientist lacks insights from clinical practice. If you look at the clinic, new questions may arise that could also be interesting for basic scientists. And vice versa. And I believe that a mutual understanding between these two groups is the most important thing. Just in order to combine brilliant minds and bring people from distinct fields' together" (clinician scientist, f06).

Furthermore, we find that clinician scientists are able to translate between research and clinic by enacting a hybrid role, clinician scientists practice and manage medical tasks (e.g. patient care and management, surgeries) and research tasks (pipetting, preparing mouse models) at the same time. Thus, they do not only function as a bridge between different research groups (inter-professional translation) but they are also combining different professional tasks in one person (intra-professional translation).

> "Clinical research and preclinical research, that´s an interface, [and] basically that´s me. I am a doctor. I have worked in the clinic and exactly do that. Now, I am going back to the animal model and see if I can find appropriate models in order to link both [practice and research] effectively" (clinician scientist, a20).

These individual challenges of inter and intra-personal translation becomes intensified when considering the complex notion of translation emerging. When asking the participants to specify what translational research means, respondents struggle to explicitly define translation:

> "Well translation… Well, I´d say that… He asked me: What´s that? Then I say: Hard to tell. There exist thousand ways of translation. Lately, it is a

> translation, not even a translation, but bridging the gap from one discipline to another. More specifically it's a personal thing. And translation is subjectively perceived the cross-linking between basic science and clinic. How one uses the clinic as efficiently as possible for basic science and the other way round, for example. Especially how the clinic triggers new stimuli and how physicians are trained in both fields… Anyway, one thing is left to say. If you`re practicing translation there is always someone who can do that" (clinician scientist, a 22).

> "Translation means to me that new research knowledge is transferred to humans within a narrow time frame. In some sense translation is almost everything, it´s just a matter of time" (clinician scientist, b03).

The interviewees cannot rely on an explicit definition to readily explain what translation means and suggest 'almost everything' between a 'personal thing' and a 'question of time'. Their struggle seems to be with relating the complex notion of translation with what they do and are occupationally, on the one hand, with general expectations that exceed their daily work, on the other.

3.8.3 Obtaining acceptance for translational work

Since the 1970s, the Anglophone discussion has problematized clinician scientists as a "rare breed" (Lemoine 2008) and "endangered" (Rosenberg 1999; Ley und Rosenberg 2002) due to the fact that medicine and biomedical research are becoming increasingly specialized. We conducted our interviews in German institutions where the concept and the implementation of the clinician scientist are comparatively new. However, we can also find a problematization of the clinician scientist concept in the German context. A clinician scientist in our sample argued that the concept could be described as an "antiquated model", because it runs counter to the trend for specialization.

> "You can argue theoretically that the balancing act between being a physician and a basic scientist is maybe even an antiquated model, because research becomes increasingly specialized and time-consuming. I also see it in my research area, the number of non-physicians is going up, and it is of course hard to combine both. Those who were predominantly in

> research have often done little clinical work and those who mainly worked in the clinic, have only done so much research. […] I think it's good when you do both, but since research becomes ever more resource intensive and specialized, this is difficult to combine. That's just a fact" (clinician scientist, b14).

> "I know this situation from a friend, a clinician scientist, in the chemical industry. Now they actually prefer traditional chemists or biologists again. So there is this trained clinician scientist with his microscope, working somewhere as a pipette slave, that's all he is now. I don't know if such sub-specialization is good for anyone, well for the others it is, but for himself, he won't benefit from that" (biomedical researcher, f32).

The initial problematization as non-specialized, relegated to a "pipette slave", may, in the long run, result in what the literature defines as "endangered" (Rosenberg 1999) or "rare" (Lemoine 2008).

We asked clinician scientists how they imagine continuing their work as clinician scientists after their training period. Most of them reported to have no clear idea of what is coming after the training program. Most assumed they would either go back to clinic or had hopes to somehow continue research alongside clinical practice. When asked to decide, most of the interviewed clinician scientists would prefer a position in clinical practice, as working conditions and salary are perceived as more favorable in the clinic than in research.

Several clinician scientists report that they miss additional training or funding programs that would help them to foster their special position after finishing their training program. Some were also concerned that they may have to stop doing research right after the training program ends as there are no institutional opportunities at hand to keep up their research position in the near future.

> "This means you are out of the [clinician scientist] program by the time you are in your mid-thirties and things have begun to work normally. Well, I don't know of any additional programs..." (clinician scientist, b08).

> "Normally, after three years of program, you are a medical specialist [Facharzt/Fachärztin] and you have some publications already, so you may well be on your way to habilitate. And then this program ends. And then you would go back to the clinic and work 100% as a physician. What a pity in fact" (clinician scientist, b07).

Their problematic status as non-specialized and insecure prospects for future work opportunities, leads clinician scientists to strive for more acceptance and credibility in their immediate work environment. We find that clinician scientists emphasize the importance of translational work and actively communicate and cooperate with relevant reference groups to improve their standing. Such groups are e.g. coworkers in the clinic, research colleagues or clinical superiors who themselves are not clinician scientists.

> "Interviewer: Why is research and the clinic so hard to combine? Could you say something about that?
>
> Clinician scientist: In Germany it is, of course it depends, if you`re lucky or in which kind of department you are working at, or how much your boss puts emphasis on that or the chief resident at your hospital station, and so on. Generally, these are two separate things: you are either in the clinic or at the lab. The mutual appreciation that 'I [the chief resident] have an assistant doctor [at the bench] who is doing research and who likes doing that and for whom I create free space' is extremely low, at least what I have experienced during my [clinician scientist] training program. I wish there would be more appreciation and even more free space so that I don't have to put four hours research on already twelve hours clinical practice. That isn't really productive" (clinician Scientists, b12).

3.9 ORGANIZATIONAL NEEDS

Based on these findings, we ask what kind of organizational measures might support the institutionalization of a translational ecology? Which measures might work as hinges to medical practice and to biomedical research to stabilize a professional space in between for clinician scientists? By comparing ranking

data from clinician scientists with those from biomedical researchers and clinicians, we want to find out what kind of organizational measures clinician scientists prioritize for a translational ecology.

To support a translational ecology, clinician scientists perceive that it is important to "strengthen unconventional research", "strengthen applied science", and to "strengthen mutual understanding between persons from basic research and clinical practice". Furthermore, they perceive that it is important to "provide long-term funding", "ensure quality standards", "provide financial resources" and "more personnel resources", as well as to "strengthen interdisciplinary collaborations". "Educate clinician scientists" and provide "more time for research" are the highest ranked measures and approaches that could foster a translational ecology.

Table 2: Top 10 statements put into the most positive extremes by clinician scientists

Statements	**Position**
05: Provide more time for research	7
45: Educate clinician scientists	7
08: Strengthen interdisciplinary collaborations	5
10: More personnel resources	5
29: Provide financial resources	4
33: Ensure quality standards	4
49: Provide long term funding	4
12: Strengthen mutual understanding between persons from basic research and clinical research	3
18: Strengthen applied science	3
28: Strengthen unconventional research	3

Comparing clinician scientists' views with those of professions we find considerable commonalities. Both groups perceive providing "time for research", "personnel resources" and "financial resources" and "long-term funding" as important measures for translation. They also perceive that a translational ecology should be "interdisciplinary" and characterized by a "mutual understanding between persons from basic research and clinical practice". Reducing these various measures into broader topics we notice a common basis of organizational measures that are perceived by both interviewee groups as supportive for translation: Sufficient financial as well as personnel resources, sufficient time for conducting research and linkages between different disciplinary fields. Despite considerable commonalities between both groups we also find some differences regarding the viewpoints. Clinician scientists find "education of clinician scientists", "quality standards", "unconventional research" and "applied science" slightly more important for a translational ecology.

Table 3: Top 10 statements put into the most positive extremes by clinicians and biomedical researcher

Statements	**Position**
49: Provide long term funding	27
08: Strengthen interdisciplinary collaborations	22
12: Strengthen mutual understanding between persons from basic research and clinical research	15
50: Include negative and positive research results in research and development process	15
01: Educate translation oriented scientists	11
05: More time for research	11

13: Reduce publication pressure	11
29: Provide financial resources	10
10: More personnel resources	9
11: Create a translational cultur	9

3.10 PROFESSIONALIZABLE WORK FOR CLINICIAN SCIENTISTS

The role of clinician scientists is overburdened with vague or completely unspecified expectations. We find that although clinician scientists attempt to meet these expectations in their day-to-day working practice they often feel torn between them. This indicates that the occupational space between medical practice and biomedical research is a venue for 'occupational battles' that have not settled into clear jurisdictions. Professionalization for clinician scientists would require strong linkages between these professional ecologies. Institutional support is currently mainly provided in the context of translational research, especially via the establishment of training programs, however, clinician scientists remain a relatively small group with no defined and exclusive occupational space. Historically, the emergence of biomedical researchers as a distinct role next to clinical practitioners was due to increasing specialization and differentiation of skills and practices. This came along with distinct expectations of what makes a clinician or researcher. The attempt to recombine these expectations and addressing them to clinician scientists, results in a mixed bag of incoherent and contested role models. There may have been a time when being both a clinician and scientist at the same time was possible, but clinic and lab were not as specialized then as they are today. The attempt to institutionalize clinician scientist programs to counteract trends of specialization provide a politically initiated bundle between research and clinic, but in fact, do not provide resilient hinges between both ecologies. As a result a set of controllable tasks for clinician scientists does not emerge.

However, what we can see from our analysis are some common understandings, not just from clinician scientists but from pure clinicians, researchers, and from the literature, of what clinician scientists are expected to do. They frame the clinician scientist as someone conducive to furthering translation. Those, who are active in clinic and research, expect clinician scientists, first, to be able to speak the two languages of research and clinic, second, to be able to translate patients' needs and clinical experiences to the laboratory and to further research, and, third, to be able to resist trends towards specialization and provide an inclusive point of view. This common understanding also extends to what is needed as resources for strengthening a translational ecology: sufficient time for research, personnel and financial resources, and a research culture that explicitly values interdisciplinarity. These commonalities reflect that the translational ecology is a bundle constituted due to overlapping ecologies: research, where time for research is valuable; medicine, where personnel and financial resources matter tremendously (especially in university hospitals); and politics, where support for translational research is predicated on interdisciplinarity.

From these findings a possible path for professionalization for clinician scientists can be discerned that emphasizes translation as a fundamental challenge for the whole of biomedicine and sees clinician scientists in the role of translators. In line with theoretical approaches that conceptualize professionalism not just as an empirical but also as a moral concept (Kultgen 1988; Koehn 1994; Abbott 2016) we thus ask: What can be done to improve the situation of clinician scientists? How can translational tasks be transformed into a jurisdiction? We deliberately avoid the separation of objectivity and advocacy (Abbott 2016, 254 ff.; Bogusz and Reinhart 2018) in the remainder of this conclusion to suggest a more coherent set of expectations for furthering the professionalization of clinician scientists beyond just combining the roles of clinicians and researchers. Our work thereby contributes to empirical studies negotiating and advocating the professional nature of clinician scientists (see e.g. Kluijtmans et al. 2017; Rosenblum et al. 2016). In this regard, we want to answer the question on how the role of the clinician scientist can be reframed without ignoring today's institutional realities. Or asked differently in using

Abbott`s terminology: How can the "avatar problem" be solved and a set of professionally controllable tasks for clinician scientists be supported?

Considering our findings the idea that clinician scientists should embody the role of clinicians and scientists simultaneously seems unrealistic. Since research and clinic are controlled by established professions, the role of the translator could be the basis on which the future of clinician scientists is built. To focus the professional role of clinician scientists on being translators between bench and bedside still requires skills and experience in both worlds, just not with the aim of practicing either patient treatment and/or biomedical research as clinicians or scientists would do. In our empirical study we identified translational tasks and organizational needs that could foster the role of a translator. In order to strengthen this position the clinician scientists need a translational arena—a place where links provide rewards in both. Such an arena, where translational tasks are specifically valued, could be the newly emerging field of "metaresearch". Already framed as central to translational efforts, systematic review and research about biomedical research and practice includes both theoretical as well as empirical investigations, it interfaces with different disciplines and it is organized by different "areas of interest: [m]ethods, [r]eproducibility, [e]valuation, and [i]ncentives" (Ioannidis et al. 2015, 2). One of the main goals "of [the metaresearch] community is to provide evidence-based guidance on policy initiatives to improve research quality" (Ioannidis et al. 2015, 6). Metaresearch combines distinct disciplinary fields and it particularly requires and values individuals who are familiar with both research and clinical work. Thus, metaresearch could be an arena of "potentially professionalizable work" (Abbott 2016, 40) for the clinician scientist that is not reducible to either clinic or research and can produce rewards in both.

We found translational tasks practiced by clinician scientists that are linked to research and clinic at the same time: e.g. to translate different languages, to translate individual patients' health needs into concrete research questions, or to constitute an interface between distinct disciplinary environments. These tasks still remain relatively vague in its description, but they may function as a 'bundle' without being rewarded in the wider ecology. In order to create hinges dual rewards in the two ecologies are needed. A field like metaresearch, which

isn't occupied by professions yet and aims to improve translation, may be more open for jurisdictional claims. A distinct role of a translator, as proposed here, needs further specification, based on empirical research. Note that our study focused on clinician scientists working in Germany and therefore leaves open how the role of clinician scientists is perceived in other health care systems. Comparative research on this matter could provide a more differentiated perspective. So far, our work may help to shape a more tangible understanding of the roadblocks and a more realistic path for the professional development of clinician scientists, without forgetting that this "avatar problem" has a long and recurring history.

3.11 APPENDIX

Table 4: Statements

Randomized Statement Number	**Statements in English**	**Statements in German**
03	Educate translation oriented scientists	Translationsorientierte Wissenschaftler/innen ausbilden
15	Analyze mechanisms of diseases more intensive	Mechanismen von Krankheiten intensiver erforschen
23	Trust in Big Data	Auf Big Data setzen
46	Enhance theory based research	Theoriegeleitete Forschung stärken
36	More time for research	Mehr Zeit für die Forschung schaffen
52	Recruit excellent scientists	Exzellente/Spitzen-Wissenschaftler/innen rekrutieren
38	Trust in new technologies within the research process	Auf neue Technologien im Forschungsprozess setzen
27	Enhance interdisciplinary work	Interdisziplinäre Zusammenarbeit stärken
07	Enhance basic science	Grundlagenforschung stärken
10	Provide more personnel resources	Mehr Personalressourcen stellen
29	Create a translational culture	Eine translationale Organisationskultur schaffen
26	Strengthen mutual understanding between	Gegenseitiges Verständnis zwischen Personen aus der

	persons from basic research and clinical research	Grundlagenforschung und der klinischen Forschung stärken
42	Reduce publication pressure	Publikationsdruck mindern
22	Develop databases	Datenbanken entwickeln
20	Involve patients in the research process	Patient/innen in Forschungsprozess miteinbeziehen
44	Clarify feasibility of clinical trails	Die Umsetzbarkeit einer Studie von vornherein klären
35	Reduce regulatory hurdles	Regulatorische Hürden abbauen
06	Enhance applied science	Anwendungsbezogene Forschung stärken
51	Strengthen systemic reviews and meta-research	Systematische Überblicksarbeiten (Reviews, Metastudien) über den aktuellen Forschungsstand stärken
19	Strengthen personalized medicine	Personalisierte Medizin stärken
13	Strengthen economical promising research	Wirtschaftlich aussichtsreiche Forschung stärken
31	Support scientists by administrational tasks	Forschende bei administrativen Aufgaben unterstützen
14	Develop guidelines suitable for daily practice	Alltagstaugliche Guidelines entwickeln
01	Organize biomedical education interdisciplinary	Die biomedizinische Ausbildung interdisziplinär gestalten
05	Teach knowledge about procedures and regulations	Wissen über Abläufe und Regularien vermitteln

30	Strengthen spin-offs	Ausgründungen stärken
28	Strengthen corporations with industry	Zusammenarbeit mit der Industrie stärken
12	Strengthen maverick science	Unkonventionelle Forschung stärken
09	Provide financial support	Finanzielle Unterstützung bieten
39	Using previous knowledge	Bisherige Erkenntnisse nutzen
34	Strengthen spatial infrastructure for (interdisciplinary) corporations (e.g. open labs)	Räumliche Infrastruktur für (interdisziplinäre) Zusammenarbeit stärken (z.B. open labs)
21	Building clinical research units	Clinical Research Unit aufbauen
43	Ensure quality standards	Qualitätsstandards sicherstellen
41	Publishing	Publizieren
50	Strengthen open access	Open Access stärken
45	Ensure representativity of clinical trials	Die Repräsentativität von Studien sicherstellen
18	Strengthen systemic approaches	Systemische Ansätze stärken
16	Explore mechanisms of agents more intensively	Mechanismen von Wirkstoffen intensiver erforschen
25	Building technology platforms	Technologieplattformen aufbauen
24	Use electronic patient files	Elektronische Patient/innenakten einsetzen
08	Set financial incentives	Finanzielle Anreize setzen

37	Bring patentable inventions	Patentierbare Erfindungen erbringen
40	Establish new journals	Neue Journals etablieren
49	Involve nursing staff into the research process	Das Pflegepersonal in den Forschungsprozess einbeziehen
02	Educate clinician scientists	Clinical Scientists ausbilden
53	Deploy animal models transferable to patient groups	Auf Patient/innengruppen übertragbare Tiermodelle einsetzen
48	Strengthen studies that compare drug efficiency	Studien stärken, die die Wirksamkeit von Medikamenten vergleichen
33	Strengthen physical closeness to relevant stakeholder	Räumliche Nähe zu relevanten Akteur/innen stärken
11	Provide long-term funding	Langfristige Förderung bieten
47	Involve negative and positive findings into R&D process	Negative und positive Ergebnisse/Befunde in den Forschungs- und Erkenntnisprozess einbeziehen
04	Educate methodological knowledge more intensively	Methodenkenntnisse intensiver vermitteln
17	Strengthen molecular medicine approaches	Molekularmedizinische Ansätze stärken
32	Support scientists at scientific tasks	Forschende bei wissenschaftlichen Aufgaben unterstützen
Total number of statements: 53		

Table 5: PubMed search strategy (in abstract and title)

Search (18.12.15)	**Number articles found**
clinician scientist[Title/Abstract]	156
translational scientist[Title/Abstract]	10
(clinical scientist[Title/Abstract])	81
(physician scientist[Title/Abstract] AND translation[Title/Abstract])	8
Total number of articles	253

Table 6: Number of analyzed articles (cleaned sample)

Abstract/title	**Number of articles**
clinician scientist[Title/Abstract]	98
translational scientist[Title/Abstract]	10
(clinical scientist[Title/Abstract])	33
(physician scientist[Title/Abstract] AND translation[Title/Abstract])	7
Total number of articles	148

Table 7: Codebook analyzing expectations

Level of abstraction	**Analytical reference**	**Examples of phrases**
High abstraction level	All key words and text phrases that refer to national aspects and do not include practical advices or recommendations, most of all famous and/or often used political buzzwords	"Clinician scientist and their contribution to research is critical for driving healthcare innovation in Canada"; Schlüsselrolle beim Erhalt der Innovationskraft [key role for continuing innovation]"
Medium abstraction level	Key words and text phrases referring to those political statements describing the role of clinician scientists and those statements dealing with hints of how a 'translational role' should be constituted; attitudes defining a translational profession	"clinician scientist can collaborate effectively with other researchers"; "the translation of discovery to the bedside, clinic and the community coupled, most recently, with insights into the gap between potential effectiveness and what ultimately occurs as a part of healthcare delivery, have been monumental in scope. This progress has unquestionably been the province of the university based clinician scientist"; individuals who lead active laboratory research programs and possess an understanding of the needs and practical realities of clinical medicine"; revision between boundaries of traditional disciplines and the creation of new alliances between experts"; essential conduit between the bench and the bedside and 'natural leaders' in the translational field"

Low abstraction level	Key words and text phrases describing how to combine clinical practice and research	"After 3 years of medical school, students would spend at least 2 years in a combined didactic and mentored clinical research training program and then complete medical school. Students could elect to pursue more prolonged clinical research training towards a combined PhD and MD"; "clinician scientists are those in which the physician has undergone advanced training culminating in a PhD"

4 VIRTUELLE IDENTITÄTEN: SCIENCE BLOGS ALS KOMMUNIKATIONSFORMAT ÖFFENTLICHER KRITIK

4.1 ABSTRACT[15]

‚Science Blogs' als ein Werkzeug der Selbstthematisierung und -inszenierung erfahren eine zunehmende Nachfrage innerhalb der wissenschaftlichen Gemeinschaft. Das Phänomen des ‚Blogging' hat folglich auch in die Welt der Wissenschaft Einzug gehalten. Vor diesem Hintergrund widmet sich der vorliegende Beitrag dem Ziel, Science Blogs als eine neue und gleichzeitig folgenreiche Form der wissenschaftlichen Kommunikation herauszuarbeiten. Dabei operiert dieser Beitrag mit einem aus der empirischen Arbeit gewonnenen Beispiel der kommunikativen Problemvermittlung von Clinician Scientists, die als eine neue Form zur Aushandlung von öffentlicher Kritik im Sinne des französischen Pragmatismus gedeutet werden kann. Durch eine öffentliche Vermittlung von persönlichen Identitäts- und Rollenkonflikten in den Science Blogs transformiert sich die tagebuchartige, ‚unscheinbare' Selbstthematisierung der Individuen zu einer öffentlichen Kritik am System der Wissenschaft. Science Blogs entwickeln sich demzufolge zu einem politischen Instrument der Identitätskonzeption ganzer gesellschaftlicher Gruppen.

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4.2 EINLEITUNG

In der Soziologie und der empirischen Sozialforschung nimmt Kritik als wesentliches Moment von Konflikten einen zentralen Stellenwert ein. Konflikte bieten in der Soziologie einen Hinweis auf vorhandene Gerechtigkeits- und Verteilungsfragen, wie sie beispielsweise in klassischen Konfliktsoziologien von Simmel (1908) und Bourdieu (1982) zu finden sind. Gleichzeitig – und dies ist für die Soziologie von erheblicher Bedeutung – können Konflikte auf (gesellschaftlichen) Wandel hindeuten, weil sie entweder praktisch gelöst werden müssen oder von den Akteuren gelöst werden wollen. Wenn Problemlösungen gefunden werden, gehen diese mit einer Änderung bestehender Handlungspraktiken einher. Somit können Konflikte als ein Hinweis für die Entstehung von etwas Neuem gedeutet werden, denn die zeigen an, wo sich bestehende Wertigkeitsprinzipien aneinander reiben. Die Soziologie der Kritik hat dabei in den letzten Jahren mit den Werken von Luc Boltanski und Laurent Thévenot (2007; 1999) insbesondere im deutschsprachigen Raum der Soziologie einen enormen Aufschwung erfahren (Peter 2011; Bogusz 2010). Ihre Soziologie der Kritik bietet konkret und in besonderer Weise eine Erweiterung der Konfliktsoziologie von Pierre Bourdieu (1982), indem sie die handelnden Subjekte aus ihren Entwicklungs- und Sozialitätskontexten weitgehend herauslösen. Demnach sind alle Individuen, unabhängig von ihrer Herkunft, zu einer „kritischen Urteilskraft" (Boltanski und Thévenot 2007) befähigt, die es den Akteuren erlaubt, in Situationen des Konflikts spezifische Rechtfertigungsordnungen zu bedienen.

Mit der Soziologie der Kritik lassen sich auf fruchtbare Weise vor allem jene empirische Felder in den Blick nehmen, die durch neue institutionelle Herausforderungen und Aufgaben gekennzeichnet sind, die von den involvierten Subjekten bewältigt werden müssen. Ein aktuelles Beispiel für solche Herausforderungen ist das Feld der Translationalen Forschung (TF) in der Biomedizin[16]. Unter dem Begriff der TF fallen Vorhaben und Maßnahmen,

[16] Zur begrifflichen Bedeutung von TF siehe Blümel et al. (2015).

die darauf zielen, die Organisation biomedizinischer Praxis zu verändern. Dabei strebt die TF eine engere Verzahnung von biomedizinischer Grundlagenforschung und medizinischer Praxis an. Durch die Emergenz dieses neuen Feldes in der Biomedizin entwickelt sich aktuell ein neuer Handlungsspielraum für (Um-)Verteilungskämpfe, die auf der individuellen Ebene in konkrete Konfliktsituationen münden[17]. Eine konkrete Konfliktsituation innerhalb der TF zeigt sich insbesondere an der Entwicklung des beruflichen Konzepts des sogenannten Clinician Scientist (u.a. auch unter den Bezeichnungen Clinical Scientist oder Translational Scientist zu finden). Durch die mittels TF eingeleitete Neuorientierung innerhalb der biomedizinischen Forschung, die eine zunehmende Beschleunigung der Übersetzung von Grundlagenforschung in die medizinische Praxis anstrebt (‚from bench to bedside'), werden die Erwartungen an das beschleunigte ‚from bench to bedside' in das einzelne Individuum verlagert (Brown und Michael 2003). Die Erwartung einer Zusammenführung von zwei verschiedenen Bereichen wie der Grundlagenforschung und der medizinischen Anwendung führt auf Ebene des Individuums zu einem Konflikt, welcher daraus resultiert, dass zwei unterschiedliche Bereiche – wie die Wissenschaft und die Medizin – mit ihren je eigenen Handlungslogiken zusammengeführt werden sollen (Wilson-Kovacs und Hauskeller 2012; Lemoine 2008; Zemlo u. a. 2000; Morel und Ross 2014). In klassischer Weise wird diese Form des Konflikts in der Soziologie als Rollenkonflikt (Merton 1957) verhandelt. Neueren Ansätzen zufolge handelt es sich beim Clinician Scientist um einen sogenannten ‚Grenzgänger' (Torka und Borcherding 2008; Wentland et al. 2012), der sich dadurch auszeichnet, dass in ihm/ihr zwei unterschiedliche Welten mit unterschiedlichen Wertigkeiten und Prioritäten aufeinanderprallen, deren praktische Umsetzung dann auf konflikthafte Weise im Alltag ausgelotet werden muss. In dieses Konzept des Grenzgängers lässt sich auch die Rolle des Clinician Scientists einordnen.

[17] Wie neue Begriffe zu politischen Kampfarenen avancieren, siehe dazu Rip und Voß (2013).

An dem Beispiel der Rollenkonflikte beim Clinician Scientist zeigt sich, dass für die subjektive Verarbeitung derartiger Konflikte ‚Science Blogs' eine zentrale Plattform darstellen. In den Science Blogs findet eine Verarbeitung derartiger Rollenkonflikte durch eine kommunikative Vermittlung von Erlebtem in Form von tagebuchartigen Einträgen statt. Dabei werden Teile des Erlebten in der Ich-Perspektive transportiert. Durch diese kommunikative Vermittlung von Erlebtem werden Science Blogs zu einem Ort, an dem sich wissenschaftliche Praktiken konkret beobachten lassen. Für eine Soziologie der Kritik werden Science Blogs insbesondere aufgrund ihres Öffentlichkeitsbezuges interessant. Denn ein Bezug zur Öffentlichkeit ermöglicht es, die individuellen und persönlichen Rollenkonflikte, die Teil des individuell Erlebten sind, in eine Form der öffentlichen Kritik zu transformieren. Damit werden Science Blogs zu Plattformen des öffentlichen Disputs im Sinne von Boltanski und Thévenot (1999; 2007). In Science Blogs kann demnach empirisch die Ausübung von Kritik und Konflikt beobachtet werden. Vor diesem Hintergrund widmet sich der vorliegende Beitrag der Frage danach, inwiefern Science Blogs konkret Zugang zu kritischen Momenten (critical moments) im Sinne einer Theorie der Kritik nach Boltanski und Thévenot (1999) leisten und welche Konsequenzen sich aus dieser Kritik für die Identitätskonzeption von Individuen ergeben. Zur Beantwortung der Fragestellung muss insbesondere die Rolle der Öffentlichkeit in den Science Blogs geklärt werden. Ziel ist es, der (medialen) Öffentlichkeit nicht nur einen passiven Part einzuräumen, indem sie eine Plattform für öffentlichen Protest schafft, sondern ihr einen gewissen Handlungsspielraum zuzuschreiben. Denn durch ihre Anwesenheit wird eine Struktur von Erwartungs-Erwartungen konstruiert, die für die Akteure in den Science Blogs selbst handlungsleitend wirkt.

Für die Beantwortung der Frage gliedert sich der vorliegende Beitrag in sechs Teile. In Teil zwei wird zunächst erläutert, welche Rollenkonflikte sich bei der Gruppe der Clinician Scientists vorfinden und welche Bedeutung Science Blogs vor diesem Hintergrund einnehmen. Im Anschluss daran widmet sich Teil drei einer theoretischen Aufarbeitung von Science Blogs als ein Medium für die Beobachtung und Entwicklung von Identitätsprozessen. In

Teil vier wird dann unter Zuhilfenahme von empirischem Material erläutert, wie Kritik in Science Blogs empirisch beobachtet werden kann. Daran anschließend wird im fünften Teil die besondere Rolle der Öffentlichkeit und die konstitutive Funktion des Dritten bei der Analyse von Kritik in Science Blogs diskutiert. Teil sechs schließt den vorliegenden Beitrag mit den Konsequenzen, die sich aus diesen theoretisch-praktischen Überlegungen für die Identitätskonzeption von Akteuren im Netz ergeben.

4.3 CLINICIAN SCIENTISTS IN SCIENCE BLOGS: EINE FORM DES EMPOWERMENTS

Bei der Gruppe der Clinician Scientists handelt es sich um Akteure, die vor der Herausforderung stehen die zwei unterschiedlichen Rollen von Wissenschaft und Medizin in einer neuen Rolle miteinander zu vereinbaren (Wilson-Kovacs und Hauskeller 2012; Vignola-Gagné 2014; Lemoine 2008). Die Erwartungen, die an diese Berufsrolle geknüpft sind, speisen sich vielfach aus dem aktuellen Diskurs um die TF in der Biomedizin[18]. Innerhalb dieses Diskurses wird die mangelhafte Übersetzung von Grundlagenwissen in die klinische Anwendung kritisiert und gleichzeitig ihre Beschleunigung gefordert (Chalmers et al. 2014; Chan et al. 2014; Ioannidis et al. 2014). Auf der handlungspraktischen Ebene überträgt die Rolle des Clinician Scientists diese Anforderungen konkret, indem sie beide Bereiche – sowohl Grundlagenwissen als auch klinisches Wissen – in der beruflichen Praxis direkt miteinander verzahnt. Auf dieser Ebene wird demnach die Lücke zwischen der Grundlagenforschung und der medizinischen Praxis geschlossen. Die ‚systemischen' Konflikte werden direkt in das Individuum verlagert. Dadurch erlangt die Gruppe der Clinician Scientists in der Diskussion um die TF eine besondere Bedeutung.

Doch trotz ihrer hohen Relevanz für die Umsetzung von TF zeigt sich empirisch, dass die Rolle des Clinician Scientists einer (persönlichen) Krise ausgesetzt ist (Rosen 2011; Zemlo et al. 2000; Daye et al. 2015). Die Krise ist

[18] Für einen Einblick in den bestehenden Diskurs siehe Blümel et al. (2015).

im Wesentlichen dadurch gekennzeichnet, dass Clinician Scientists zwei Bereiche mit je eigenen Logiken und Referenzmodi in einer neuen Rolle zu vereinbaren haben. Dabei sehen sie sich zwei verschiedenen Bezugsgruppen bzw. Bezugsbereichen gegenüber, die bisweilen relativ autonom agieren. Dazu gehört die Wissenschaft als eigenständiger Bereich mit eigenen Werten und Prinzipien (Merton 1957) und die Medizin als eigenständiger Bereich, mit wiederum eigenen Werten und Handlungsprinzipen. Zwar wird in der TF die Aufhebung einer Trennung (der Grenzen) diskutiert, in praktischer Hinsicht ist diese Trennung jedoch in vielen Bereichen (noch) vorhanden. Die Übertragung der Erwartungen einer Verknüpfung von Wissenschaft und medizinischer Praxis führt demnach zu Problemen der individuellen Überforderung, die auf institutioneller Ebene nicht abgeholt bzw. aufgefangen werden können. Damit erleidet der/die Clinician Scientist einen persönlichen Konflikt, der auf individueller Ebene einem Disput zwischen zwei Rollen entspricht.

Durch den fehlenden institutionellen Bezugsrahmen, welcher sich im Wesentlichen durch eine fehlende bzw. noch nicht hinreichende Professionalisierung auszeichnet (Vignola-Gagné 2014), mangelt es zugleich an einem Ort, an welchen die persönlichen Krisen medial-öffentlich verhandelt werden können. Science Blogs können für solche individuellen Konflikte eine Plattform bieten und durch ihren Bezug zur wissenschaftlich-gesellschaftlichen Öffentlichkeit dazu beitragen, dass aus den persönlichen (Rollen-)Konflikten Konflikte einer definierten Gruppe werden. Damit können Blogeinträge von Clinician Scientists zu einer Institutionalisierung der neuen Identität beitragen. Denn erst, wenn die Probleme öffentlich werden, werden aus den Problemen des Einzelnen die Probleme aller Statusinhaber/innen (Merton 1957). Aus den ursprünglich individuellen Problembeschreibungen und Alltagserfahrungen entwickeln sich durch den Bezug zur Öffentlichkeit Probleme und Alltagserfahrungen, mit denen sich eine spezifische Gruppe identifizieren kann. Damit werden Science Blogs zu einem Werkzeug des ‚Empowerments' von professionellen Gruppen, die sich noch in einem institutionellen Entstehungsprozess befinden. Farrel und Sides (2010) haben vor diesem Hintergrund in ihrer empirischen Studie „Building a Political Science Public Sphere with Blogs" Strategien identifiziert, die zeigen, dass beispielsweise

Politologen Blogs für eine Verbesserung und Aufwertung ihrer öffentlichen Profile nutzen und damit zur Stärkung ihrer eigenen Profession beitragen. Die Studie verdeutlicht, dass sich aus einer persönlichen Problembeschreibung durchaus ein (professioneller) Aktionismus entwickeln kann.

4.4 SCIENCE BLOGS ALS ORT DER IDENTITÄTSBILDUNG

In den Science und Technology Studies (STS), den Studien zur Science Communication (CS) und dem Forschungsfeld der Technoself Studies (TSS) sind Science Blogs zu einem wichtigen Gegenstand avanciert (Kouper 2010; Minol et al. 2007; Luppicini 2013). Aufgrund ihrer Offenheit ist die wissenschaftliche Kommunikation in Science Blogs sowohl für wissenschaftliche als auch für nicht-wissenschaftliche Akteure und Bezugsgruppen zugänglich. Vor diesem Hintergrund spricht die Bildungswissenschaftlerin Marie-Claire Shanahan (2011) von Science Blogs als sogenannte ‚boundary objects' zwischen Wissenschaft und Gesellschaft, weil sie ganz neue „writer and reader interactions" (ebd., 903) konstituieren. In ihnen werden wissenschaftliche Diskurse für unterschiedliche Gruppen zu einem gut beobachtbaren Gegenstand. Und über diesen wissenschaftlichen Diskurs wird für die Beobachtenden konkret ein Teil der wissenschaftlichen Praxis zugänglich (Knoblauch 1995; Keller et al. 2012). Science Blogs sind damit Orte, an denen sich die diskursive Verhandlung von Konflikten beobachten lässt, die das Resultat wissenschaftlicher (Labor-)Praktiken sind.

Auf der individuellen Ebene bieten Science Blogs ein Forum für die Verarbeitung von diversen Frage- und Themenkomplexen sowie Problemstellungen, die sich in der alltäglichen wissenschaftlichen Praxis ergeben. Sie haben typischerweise ein bestimmtes, auf den Gegenstand Wissenschaft bezogenes Thema und erscheinen häufig in der Form eines persönlichen Tagebuches (Wilkins 2008). Diese Praxis der Problemverarbeitung in öffentlichen Beiträgen findet sich unter dem Konzept der „Selbstthematisierung", welches die „Methoden der geregelten Konfrontation mit sich selbst" beschreibt (Hahn und Kapp 1987). Durch die

Selbstthematisierung findet in den Science Blogs eine kommunikative Vermittlung der individuellen Bedürfnisse und Problemlagen nach außen statt. Sie entwickeln sich dadurch zu einem Werkzeug der Identitätsbildung. Mittels dieser öffentlichen Selbstthematisierung kann, bewusst oder unbewusst, ein Akt der Identitätskonzeption in Gang gesetzt werden, in welchem dann die individuellen Merkmale einer Gruppe öffentlich definiert werden.

Die für die soziologische Perspektive relevante Verbindung von kommunikativer Vermittlung und Identitätskonzeption schafft in dezidierter Weise die empirische Arbeit der Soziologin Scherry Turkle (2005). In ihrer Studie „The Second Self: Computers and the Human Spirit" erläutert Turkle, inwiefern Computer und deren Nutzung einen Beitrag für die Identitätskonzeption von Menschen leisten. Vor diesem Hintergrund widmet sie sich empirisch insbesondere der Entwicklung des Selbstbildes bei Kindern und Jugendlichen, und erklärt das Internet zu einem wesentlichen Instrument für die Erforschung des Selbst und der Sozialität.

> „In instrumental terms, the Internet changed every aspect of life in communications, economics, politics and the arts. But it also changed how we saw ourselves and our relationships; online life became a social location for the projection and exploration of self" (Turkle 2005, 287 f.).

Die kommunikative Vermittlung, die durch ein Individuum im Internet vollzogen wird, entwickelt sich zu einem Medium der Identitätskonzeption und wird damit Bestandteil der gesellschaftlichen Wirklichkeit.

Das Blogging erhält über die Selbstthematisierung ferner eine politische[19] Komponente, was die Reichweite derselbigen erheblich vergrößert. Mittels der öffentlichen Kommunikation von Problemen und Meinungen wird eine Art ‚Agenda Setting' von verschiedenen Gruppen und Akteuren betrieben, die wiederum ganz unterschiedliche Akteursgruppen erreicht bzw. Bezugsgruppen definiert. Dadurch entwickeln sich dem Historiker und

[19] Der Begriff ‚politisch' wird hier verwendet, wenn eine Handlung öffentlichkeitsgerichtet ist und gemeinschaftsstiftend wirkt.

Wissenschaftsphilosoph John S. Wilkins (2008) zufolge Science Blogs zu Werkzeugen für politische ‚Überzeugungsarbeiten'. Die Gründe für das Blogging und das ‚Agenda Setting' sind dabei insgesamt vielfältiger Natur und entsprechend würden die Themen, so der Autor, strategisch unterschiedlich platziert (ebd., 7). Wilkins beschreibt die Entwicklung der Bloggendenbewegung daher als eine ‚bedeutende soziale Bewegung' (major social movement), denn das Blogging führe dazu, dass sich die Bloggenden miteinander vernetzen und eine Gemeinschaft (community) bilden, die sowohl berufliches als auch privates miteinander verbindet (ebd.).

4.5 ÖFFENTLICHE KRITIK IN SCIENCE BLOGS

Damit Kritik empirisch beobachtet werden kann, müssen theoretisch-praktische Voraussetzungen erfüllt sein. Diese Voraussetzungen gelten auch für die Beobachtung von Kritik in Science Blogs. Dazu gehören zum einen Anforderungen, die direkt an die Akteure gestellt werden (Akteurskonzept) und Anforderungen an den situativen Kontext (Situationsdefinition). Im Folgenden werden die wesentlichen Begrifflichkeiten einer Theorie der Kritik skizziert, die sich in den Werken „Über die Rechtfertigung" (2007) und „The Sociology of Critical Capacity" (1999) von Luc Boltanski und Laurent Thévenot finden. Parallel dazu findet im Weiteren eine Unterfütterung der Theorieeinheiten mit empirischen Auszügen aus den Science Blogs statt. Dies ermöglicht eine Veranschaulichung der Übersetzung von theoretischen Beschreibungen direkt auf das empirische Material. Die Ausarbeitung der zentralen Beobachtungseinheiten der Theorie der Kritik ist dabei begleitet von dem Werk „Zur Aktualität von Luc Boltanski" von Tanja Bogusz (2010), die eine dezidierte Aufarbeitung der Werke Boltanskis vorgenommen hat. Die vorliegende Skizzierung erhebt dabei keinen Anspruch auf Vollständigkeit der konstitutiven Elemente einer Soziologie der Kritik, sondern skizziert lediglich jene Elemente, die in der eigenen empirischen Arbeit als Voraussetzung für die Analyse von Situationen der Kritik ermittelt wurden. Das heißt, es werden diejenigen Elemente als zentral betrachtet, die mindestens gegeben sein

müssen, um eine Situation der Kritik bzw. den darum entstehenden ‚Disput' empirisch beobachten und beschreiben zu können.

4.5.1 Die kritische Urteilskraft

Boltanski und Thévenot (2007; 1999) definieren einen Akteur, welcher die Fähigkeit zum kritischen Urteilen in sich trägt, um die in den pluralistischen Gesellschaften gestellte Gerechtigkeitsfrage im praktischen Handlungsalltag einfordern zu können. Dieses spezifische Akteurskonzept ist von zentraler Bedeutung und zeigt sich Bogusz (2010) zufolge insbesondere in Situationen, die durch Herausforderungen, Prüfungen oder Konflikte gekennzeichnet sind. In diesen Situationen zeige sich die spezifische Akteurskompetenz darin, „die Situation [der Herausforderung, Prüfung oder Konflikts] durch diskursive und performative Handlungen zu definieren (ebd., 47 f.). Der Begriff der Prüfung ist Bogusz zufolge angelehnt an die Arbeiten von Bruno Latour über Louis Pasteur, in denen Prüfung für ein situatives Ereignis steht, das die traditionellen Praktiken innerhalb der Wissensproduktion herausfordert (Bogusz 2010; Latour 1988).

> „Prüfungen im allgemeinen Sinne […] stellen dabei Herausforderungen an die Wirklichkeitskonstruktion dar. An der Prüfung offenbart sich […] ein moralischer und natürlicher Gemeinsinn, und sie bezeichnet zugleich eine kritische Kompetenz [der Akteure]" (Bogusz 2010, 51 f.).

Situationen der Prüfung finden sich bei Clinician Scientists, wenn sie mit der Herausforderung konfrontiert werden Forschung und medizinische Praxis im Alltag miteinander zu verbinden. Diese Erwartung stellt eine Herausforderung an die genuine Rolle des Arztes bzw. der Ärztin dar, insofern neue Logiken der Wissensproduktion Einzug in die alltägliche Praxis erhalten. Gleichzeitig sind sich die Akteure in einer reflexiven Weise dieser Prüfung bewusst, indem sie beschreiben, dass sie mit zwei Identitäten umzugehen haben, die jeweils spezifische Anforderungen mit sich bringen, wie das folgende Zitat aus einem Blogeintrag zeigt.

> „This is the identity we promote at the program I direct […]. We call it a ‚Practitioner-Scientist' Model, whereby the emphasis is placed first and foremost on our identities as health service providers, and secondarily on psychological science" (Blog 9, Abs. 30).

Die Prüfung gestaltet sich in diesem konkreten Fall aus einer Zusammenführung der Identität als ‚health service provider' (Praxis) und der Identität als ‚psychological scientist' (Forschung).

4.5.2 Der Handlungs- und Wertepluralismus

Boltanski und Thévenot erweitern in reflexiver Weise das Habituskonzept in der kritischen Soziologie von Pierre Bourdieu, indem sie den Ansatz eines Werte- und Handlungspluralismus hinzufügen. Der Handlungs- und Wertepluralismus lässt sich – im Gegensatz zum eher starren Habituskonzept – nicht nur in spezifischen Gruppen oder Milieus beobachten, sondern auch in einer einzigen situativen Handlung (Bourdieu 1982; Bogusz 2010, 40). Der Handlungs- und Wertepluralismus wendet sich somit nicht nur gegen die im Vorhinein gemachte Setzung von Interessen der Akteure durch Sozialisations- und Entwicklungsprozesse, sondern erklärt darüber hinaus das Individuum zu einem Akteur verschiedener Gruppen, welches über ein geteiltes Interesse verfügt. Bei der Rolle des Clinician Scientists lässt sich empirisch ein solch geteiltes Interesse gut beobachten.

> „So that is what I am trying to do now – attempting to stabilize my professional identity crisis […] of patient care, research and medical education – being an active innovative clinician and a cutting edge researcher and moving from the bedside to the laboratory and back to the bedside again" (Blog 5, Abs. 22; Hervorh. i. O.).

Das hier vom Clinician Scientist – teilweise in sarkastischer Weise vermittelte – Interesse teilt sich in die drei Bereiche Patientenpflege, Forschung und medizinische (Aus-)Bildung. Alle drei Interessen stehen auf konflikthafte Weise zueinander in Beziehung, wobei die Konflikthaftigkeit dieser Bereiche durch

die Knappheit an Zeit entsteht, alle drei ‚wertvollen' Bereiche in ausreichendem Maße ausfüllen zu können.

4.5.3 Rechtfertigungsprinzipien und Situationen der Kritik

Der Handlungs- und Wertepluralismus in der Theorie der Kritik bzw. der kritischen Urteilskraft erlaubt es den Akteuren in Situationen des Disputs auf verschiedene Formen der Rechtfertigung zu rekurrieren. Diese Rechtfertigungen sind Prinzipien, die die Personen in spezifischen Situationen abrufen können, um in Momenten des Konfliktes ihre Argumentation zu stützen. Ausgearbeitet haben Boltanski und Thévenot zunächst einmal sechs spezifische Rekurswelten, auf die die Akteure in Konfliktmomenten Bezug nehmen können: die inspirierte Welt, die häusliche Welt, die Welt der (öffentlichen) Meinung, die zivilgesellschaftliche Welt, die Welt des Marktes und die Welt der Industrie (Boltanski und Thévenot 2007; Bogusz 2010, 45 f.). Da sich die Ausarbeitung der Rechtfertigungsordnungen auf empirische Untersuchungen stützt, sind diese historisch kontingent. In „Der neue Geist des Kapitalismus" fügen Boltanski und Chiapello (2001) beispielsweise die projektbasierte Welt als neue Rekurswelt hinzu. Thevénot et al. (2000) definieren darüber hinaus noch eine grüne bzw. ökologische Rekurswelt. Die Gültigkeit von Rechtfertigungen muss daher immer wieder empirisch geprüft werden.

Boltanski und Thévenot (1999) zufolge spielen Situationen der Kritik im Gesellschaftsleben eine ganz besondere Rolle. Denn erst mittels der Kritik können Übergänge von einer Rechtfertigungsordnung in eine andere in Gang gesetzt und damit Wandel von Wertigkeiten vorangetrieben werden. Kritik meint dabei Infragestellung der genannten Welten und bietet damit „unmittelbare Motivation für eine Verschiebung von Rechtfertigungsordnungen" (Bogusz 2010, 56). Situationen der Kritik münden aber nicht zwangsläufig in einer Übereinkunft (agreement) hinsichtlich einer Rechtfertigungsordnung. Es gibt Boltanski und Thévenot zufolge auch einen weiteren Weg einen Disput zu beenden, und zwar jenen der Kompromissbildung. Wenn es nicht gelingt in Situationen des Konflikts eine

Rechtfertigungsordnung als die eine gültige Ordnung durchzusetzen, kommt es zu Momenten der Kompromissfindung (Boltanski und Thévenot 1999, 373 ff.). Kompromissfindungen sind der Versuch, Konflikte beizulegen, deren letztendliche Klärung in einer Situation nicht durch die Einigung auf ein Wertigkeitsprinzip vollzogen werden kann. Kompromisse sind Boltanski und Thévenot zufolge jedoch durch Instabilität gekennzeichnet, weil sie nur vorgeben als bestünde eine Gleichwertigkeit (equivalence) zwischen den Wertordnungen (ebd.). Eine solche Form der Kompromissbildung als Beendigung von Disputen finden wir auch in den Science Blogs.

> „Although clinic time can take time away from research time, I think it adds value to the research we do" (Blog 10, Abs. 19).

Der Konflikt zwischen den Interessen wird über einen Kompromiss gelöst. Der Forschung wird in diesem Beispiel eine höhere Wertigkeit zugeschrieben als der klinischen Praxis. Da aber beide Bereiche zwangsläufig in der Rolle des Clinician Scientists miteinander vermittelt werden müssen, findet eine Kompromissbildung statt. Diese Kompromissbildung offenbart sich durch das Argument, dass die klinische Praxis einen wertvollen Beitrag für die Forschung leistet.

4.6 ÖFFENTLICHKEIT UND DIE FUNKTION DES DRITTEN

Science Blogs sind ein Ort, an welchem beobachtet werden kann, wie Clinician Scientists ihr Unbehagen (Kritik) ausdrücken. Der/die Clinician Scientist sieht sich mit einer außeralltäglichen Situation konfrontiert, in der die tradierten Praktiken des ‚Arztseins' herausgefordert werden (Prüfung). Innerhalb dieser tradierten Arztpraktiken ist vor allem das Arzt-Patienten-Verhältnis von zentraler Bedeutung (Lachmund 1987; Lachmund und Stollberg 1995). Dieses wird nun durch ein Durchdringen neuer Praktiken der Wissensproduktion durchzogen, durch die sich die einzelnen Akteure in individuellen Situationen herausgefordert sehen. Die Infragestellung dieser Herausforderungen (kritische Kompetenz der Akteure) und die Anforderungen an die neue Rolle des

Clinician Scientists lassen sich in Science Blogs gut beobachten (siehe Abschnitt 4.5). Hier werden die alltäglichen und individuellen Herausforderungen in Form von Kritik, die prozessual als eine Problembeschreibung verhandelt wird, in die Öffentlichkeit getragen. Damit werden persönliche Konflikte übersetzt in eine öffentliche Kritik, die prinzipiell von jeder anderen, beliebigen Akteurs- bzw. Interessengruppe eingesehen werden kann. Mit der Veröffentlichung persönlicher Konflikte auf öffentlichen Plattformen gelingt demnach in besonderer Weise eine Sichtbarmachung von Kritik für beteiligte und unbeteiligte Dritte.

Mit der Veröffentlichung persönlicher (Rollen-)Konflikte auf medialen Plattformen wie den Science Blogs, die eine spezifische Öffentlichkeit und damit Zuschauerschaft mit sich bringen, wird der innere Rollenkonflikt in eine öffentliche Kritik übersetzt und damit die Voraussetzung für die Aushandlung von öffentlich beobachtbaren Konflikten geschaffen. Konflikte können (empirisch) überall dort beobachtet werden, wo Kritik öffentlich geäußert wird. Eine (öffentliche) Kritik hat zwangsläufig eine/n Adressat/in, an den die Kritik gerichtet ist. In Science Blogs ist diese/r Adressat/in in erster Linie die Öffentlichkeit selbst, mit ihren vielen und zum großen Teil für den/die Beobachter/in nicht sichtbaren Zuschauern. Der Dritte, in Form von sichtbaren und unsichtbaren Zuschauenden, erhält in Science Blogs eine konstitutive Funktion, wenn es darum geht, Science Blogs als Plattform für die Austragung von Situationen des Disputs aufzubereiten[20].

Die Bedeutung, die der Dritte oder auch die Triade für die Konzeption von sozialen Beziehungen und für Sozialität selbst hat, findet sich schon in den Arbeiten von Georg Simmel (1908). Simmel stellt in seinem Werk

[20] Sabine Maasen und Barbara Sutter (2016) argumentieren in eine ähnliche Richtung, indem sie Blogs als eine Technologie der Überwachung beschreiben. Ein Blog gestaltet sich demnach als dezentrales Panoptikum, „das sich vom benthamschen Konstrukt wesentlich dadurch unterscheidet, dass es auf die nicht sichtbare Anwesenheit von kontrollierendem Personal zur Sicherung von Disziplinierung und Ordnung verzichten kann: Durch digitale Datenkanäle verflüchtigt sich die Unterscheidung zwischen Überwachenden und Überwachten in verschiedenen Bereichen – und dies, wiederum anders als im ursprünglichen Konstrukt – qua Einverständnis“ (Maasen und Sutter 2016, 191).

„Untersuchungen über die Formen der Vergesellschaftung" die Frage, wie Gesellschaft überhaupt möglich ist. Sozialität im Sinne von Institutionalisierung ist Simmel zufolge erst durch eine triadische Sozialitätskonzeption möglich. Simmel ist dabei Vorläufer für die Idee des Dritten als konstitutives Element für eine soziale Ordnung, wie sie Berger und Luckmann (1980) herausgearbeitet haben. Doch fehlt hier noch eine klare Unterscheidung von anwesenden Dritten und nicht anwesenden Dritten. Um eine dauerhafte Herstellung einer Ordnung zu ermöglichen, muss der Dritte als abwesend gedacht werden, denn der anwesende Dritte ist Teil einer konkreten Situation und damit prinzipiell auch beeinflussbar (Lindemann 2010). Eine soziale Ordnung kann aber nur durch dauerhafte und stabile Erwartungen erzeugt werden, die in verschiedenen Situationen Bestand haben. Dies gelingt demnach nur über den nicht anwesenden Dritten (Luhmann 1987; Lindemann 2010). Der Dritte ist damit wesentlich für die Etablierung einer Struktur von dauerhaften Erwartungs-Erwartungen (Lindemann 2006, 2010).

Ausgehend von den Unterscheidungen von Tertiarität stellt sich unmittelbar die Frage, welchen Einfluss die Anwesenheit bzw. die Abwesenheit des Dritten auf die Situation des Disputs nimmt? Oder anders gefragt: Welchen Unterschied macht es, wenn sich Clinician Scientists in ihrer Kritikäußerung auf einen konkreten, anwesenden Dritten oder auf einen weniger konkreten, unsichtbaren Dritten beziehen? Mithilfe dieser theoretisch-analytischen Unterscheidungen lassen sich für die Analyse von Kritik in Science Blogs explizit zwei Konfliktebenen herausarbeiten.

4.6.1 Erste Konfliktebene

Die erste Ebene des Konflikts behandelt dabei jene Form der Kritik, die sich an einen sichtbaren, anwesenden Dritten richtet. Dieser Dritte gestaltet sich in diesem Fall in Form eines/einer Zuschauer/in, welche/r dem bzw. der einzelnen Blogger/in in gewisser Weise ‚gewiss' sein kann. Hierbei handelt es sich beispielsweise um Abonnent/innen von Blogs oder um Einträge, die sich auf bestimmte Blogeinträge beziehen. Bei letzterem handelt es sich um eine konkrete Stellungnahme. Diese Stellungnahme geschieht in der Regel via

Hyperlinks zu anderen Blogeinträgen oder über Antwortfunktionen in den Blogs. In diesem Fall ist ein öffentlicher Konflikt zwischen zwei Parteien zu beobachten, der eine Nachzeichnung der Rekurswelten (Rechtfertigungsmuster) von beiden Parteien ermöglicht. Durch den anwesenden Dritten ergeben sich verschiedene Möglichkeiten analytischer Zugänge zum Konflikt. Dabei haben wir erstens einen Zugang zu der Kritik und der Rechtfertigungspraktik des Nachrichtensendenden (Blogger/in). Darüber hinaus können wir zweitens Adressat/innen oder Zuhörerende bestimmen, die auf die Kritik des Nachrichtensendenden Bezug nehmen. Ferner lassen sich drittens, durch den Einbezug von Adressat/innen, die Rekurswelten derselben nachzeichnen.

Wenn der anwesende Dritte in einer Situation Stellung bezieht, wie im oben genannten Beispiel über die Antwortfunktion skizziert, entwickelt sich der anwesende Dritte dann zu einem Alter. Da Alter in den Blogs nicht zwangsläufig gegeben sein muss und Ego niemals sicher sein kann, ob Alter in Erscheinung tritt, muss hier wie folgt argumentiert werden: Der anwesende Dritte kann sich im Einzelfall zu einem Alter entwickeln; nicht Alter zu einem anwesenden Dritten. Ob der anwesende Dritte jemals zum Alter avanciert, liegt immer in der Entscheidungsmacht des potenziellen Alters, der quasi immer nur in Form eines anwesenden Dritten für den Bloggenden (Ego) zugänglich ist. Ego hat keine Entscheidungsmacht über den Status seiner Gegenüber. Daher bildet der anwesende Dritte in diesem Fall den grundlegenden Erwartungsbezug. Mit dem anwesenden Dritten werden in Science Blogs Auseinandersetzungen zu einer ‚gewöhnlichen', öffentlichen Protestsituation (Bogusz 2010, 119), die empirisch untersucht werden kann.

Im folgenden Auszug wird die gewöhnliche Konfliktsituation verdeutlicht. Die Situation der Kritik wird in diesem Fall von Alter begleitet, der im Laufe des Blogprozesses in Erscheinung getreten ist. Kritisiert wird in diesem Abschnitt eines Blogeintrages die diskursive Stilisierung einer Trennung von Forschung und medizinischer Praxis, die es laut Bloggenden de facto in der Praxis nicht gibt. Dabei rechtfertigt die bloggende Person ihre Kritik über die Argumentation einer Reziprozität von Forschung und medizinischer Praxis:

> „'Should I do research during my […] days and how will it benefit me?' is a frequent question asked by medical students to their Professors and peers. The reason for this doubt is the fact that many of us consider as clinical medicine and research to be separate entities, which in fact is not true! They are both dependent on one another and only if both develop together will there be continuous improvement in the science of medicine. Clinical medicine and medical research can be thought of like a cycle- clinical practice provides the "data" for conducting research projects which, in turn discovers newer drugs, procedures and guidelines which influence the clinical practice and this goes on" (Blog 13, Abs. 3).

Auf die Kritik der diskursiven Stilisierung antwortet das in Erscheinung getretene Alter mit einer Zustimmung (agreement). Diese Zustimmung wird jedoch im Zuge der weiteren Argumentation durch zusätzliche Kritik limitiert. Dazu folgender Abschnitt von besagtem Alter:

> „I agree with you on this, [name of blogger; anonym.]. The research exposure that medical students get in India does not meet the standards of other countries. But then again, handling the tremendous patient load in a populous country like ours and dedicating time to research is a tough task. Nevertheless, it'll do us a great deal of help if this concept of Clinician Scientist catches up in India right from the UG level, for the ultimate benefit of the patients themselves…" (Blog 13, Abs. 3).

In dieser Situation der Kritik wird deutlich, dass ein gemeinsamer, aber begrenzter Wertebezug hergestellt ist, der besagt, dass ein wechselseitiger Bezug von Forschung und medizinischer Praxis vorhanden ist und praktisch gelebt wird. Gleichzeitig findet eine Begrenzung der Zustimmung auf andere nicht so bevölkerungsreiche Länder wie Indien statt. Denn durch die hohe Bevölkerungsdichte nimmt der Anteil an zu behandelnden Patient/innen zu, sodass eine Vereinbarkeit von Forschung und Patientenversorgung schwieriger bis unmöglich wird.

4.6.2 Zweite Konfliktebene

Die zweite Ebene des Konflikts behandelt jene Form der Kritik, die sich an einen unsichtbaren, abwesenden Dritten richtet. Dieser Dritte gestaltet sich in Science Blogs in der Form eines unsichtbaren „bystanders" (Goffman 1981, 130), wie ihn Goffman beschrieben hat. Das Besondere an den ‚zufälligen Zuschauern' ist, dass ungewiss bleibt, ob sie da sind und wenn sie da sind, ob sie dem Gespräch lauschen oder es einfach überhören (ebd., 132). Gleiches gilt für den Sender einer Nachricht in Science Blogs. Aufgrund der Offenheit und Zugänglichkeit von Science Blogs lassen sich die Adressat/innen subjektiv zum Teil vom Sender bestimmen[21], ob die Adressat/innen auch tatsächlich zuhören, bleibt jedoch ungewiss. Der unsichtbare, abwesende Dritte konstituiert demnach in Science Blogs eine/n Adressat/in, und darüber hinaus eine/n ‚stille/n' und nicht reaktive/n Zuhörer/in. Das Besondere am unsichtbaren Dritten ist, dass er mittels der Vorstellungskraft des Bloggenden im Prinzip jede gewünschte Position einnehmen kann. Der/die Blogger/in kann sich durch das Schreiben, das heißt, die Art und Weise wie er/sie sich selbst thematisiert, ihre eigenen Zuschauer/innen bzw. Zuschauergruppen konstruieren.

Durch den abwesenden Dritten ergeben sich weitere und durchaus fruchtbare analytische Zugänge zur Situation des Konflikts. Mithilfe des abwesenden Dritten lassen sich – wie beim anwesenden Dritten auch – die Art der Kritik sowie die dahinterliegende Rechtfertigungspraktik des Nachrichtensendenden (Blogger/in) ermitteln. Das heißt, es lässt sich erschließen, was infrage gestellt und auf welche Rekurswelten dabei Bezug genommen wird. Ebenso kann untersucht werden, gegen wen bzw. welche Umstände sich die formulierte Kritik des Nachrichtensendenden richtet. Der/die Adressat/in wäre also auch in diesem Fall interpretierbar. Darüber hinaus – und hier unterscheiden sich die beiden Zugänge – lässt sich beim

[21] Beim Verfassen eines Blogeintrages können aus der Perspektive des Bloggenden Adressat/innen gedacht werden. Dies zeigt sich unter anderem in der Art und Weise, wie Texte formuliert sind und welcher Umgangssprache sie sich bedienen. Ob die vom Autor bzw. Autorin gewünschte Zielgruppe allerdings auch erreicht wird, bleibt darüber hinaus aber unklar.

unbeteiligten Dritten die Rekurswelt des Gegenübers nicht in der Art und Weise bestimmen, wie es beim anwesenden Dritten der Fall ist. Beim anwesenden Dritten, oder je nach Beschaffenheit der Situation Alter, lässt sich in direkter Weise bestimmen, wie die Kritik vom Nachrichtensendenden aufgenommen und verarbeitet wird. Beim unbeteiligten Dritten gelingt der Zugang zum Konflikt bzw. zur formulierten Kritik beider Parteien über die normativen Vorstellungen des Nachrichtensendenden (Blogger/in). Der nicht anwesende Dritte nimmt insofern Einfluss auf die Kommunikation in den Science Blogs, als dieser die normativen Ansprüche des/der gewünschten Adressat/innen in der vermittelten Kommunikation des Nachrichtensendenden spiegelt. Das heißt, die Kritik, die vom Bloggenden (Nachrichtensender/in) geäußert wird, ist eine Kritik gegenüber gültigen Praktiken (Normen), die durch den abwesenden Dritten hervorgerufen werden. Beim Konflikt mit einem abwesenden Dritten haben wir es konsequenterweise mit einer Form von öffentlicher Kritik gegenüber gültigen Handlungspraktiken in (teil-)gesellschaftlichen Bereichen zu tun. Damit erlangt die öffentliche Kritik über die analytische Kategorie des abwesenden Dritten eine veränderte Reichweite, weil sie sich dadurch zu einer Art normativen ‚Systemkritik' transformiert.

Folgendes Beispiel aus der Empirie soll jene Systemkritik veranschaulichen. Bei diesem Blogabschnitt handelt es sich um die Kritik an einer zunehmenden Trennung von Forschung und Medizin, die laut Nachrichtensender/in durch eine zunehmende Polarisierung der Clinician Scientist-Identität hervorgerufen würde:

> „An unfortunate side effect of the polarization of the physician-scientist identity appears to be an undesirable gap between research and the practice of medicine. […] This research-practice gap can mean that the words of physician scientists, who may not be clinically active, don't hold much clout in real world settings with physicians who spend the totality of their working day at the bedside, tending to patients. This is being realized and appreciated by grant funding agencies who are now placing more emphasis on personalized medicine and effectiveness studies versus an over reliance on efficacy studies" (Blog 5, Abs. 20).

Die Rechtfertigung der Kritik findet ihren Weg über die zusätzlichen Forschungsaktivitäten, die Clinician Scientists neben dem klinischen Alltag vollziehen. Die dadurch geringere Anwesenheit auf der Patientenseite (bedside) führt zu einem Reputationsverlust bei jenen Kolleg/innen, die Vollzeit an der Patientenseite arbeiten. Diese Trennung von Forschung und Medizin ist aber nicht ursächlich durch die Geringschätzung der Kolleg/innen zu erklären, sondern durch die Veränderungen innerhalb des Finanzierungssystems in der Medizin, die zunehmend eine personalisierte Medizin gegenüber eine Medizin basierend auf Wirksamkeitsstudien belohnt.

4.7 Science Blogs als Form des politischen Engagements

Science Blogs erweisen sich als ein neues und modernes Kommunikationsmedium innerhalb der Wissenschaft, die eine kommunikative Vermittlung von wissenschaftsbasierten Themen, Problem- und Fragestellungen in die wissenschaftlich-gesellschaftliche Öffentlichkeit ermöglichen. Die kommunikative Vermittlung gestaltet sich dabei in Form einer öffentlichen Selbstthematisierung der Individuen (Hahn und Kapp 1987). Genau diese Möglichkeit einer öffentlichen Selbstthematisierung macht Science Blogs zu einem Forum, in welchem die Akteure ihr „Unbehagen [...] zum Ausdruck bringen“ (Bogusz 2010, 119) können. Ein solcher Ausdruck von Unbehagen kann gegenwärtig bei den Clinician Scientists im Feld der Biomedizin gut beobachtet werden. Das Unbehagen ergibt sich in diesem Fall durch die mittels TF eingeleitete Herausforderung zwei unterschiedliche gesellschaftliche Logiken (Wissenschaft und Medizin) auf der handlungspraktischen Ebene miteinander zu vermitteln und in einer neuen Rolle zu institutionalisieren (Lemoine 2008; Zemlo et al. 2000). Durch den Einbezug von Öffentlichkeit verwandelt sich der einstige Ausdruck von Unbehagen in eine öffentliche Infragestellung. Dies geschieht dadurch, dass die Öffentlichkeit aus einer formalen Selbstthematisierung in den Science Blogs eine politische Inszenierung konstruiert. Versteckt unter dem Deckmantel ‚unscheinbarer', tagebuchartiger Blogeinträge werden in den Science Blogs

Probleme einer ganzen Gruppe für die Öffentlichkeit inszeniert. Unter Einschluss der Öffentlichkeit wird aus den individuellen Problembeschreibungen, dem Ausdruck des Unbehagens, eine öffentliche Infragestellung und damit eine Form der öffentlichen Kritik. Blogeinträge beinhalten nichts anderes als die genuin öffentliche Infragestellung von alltäglichen, wissenschaftlichen Praktiken. Science Blogs sind demnach nicht nur Orte, an denen sich die diskursive Verhandlung wissenschaftlicher Praktiken beobachten lassen, sondern auch Orte, an denen die politischen Interessen und Formationen spezifischer Gruppen verfolgt werden können. Damit transformieren Science Blogs die Vermittlung persönlichen Unbehagens zu einem Akt politischer Formation und damit zu einem Akt der Identitätsbildung von spezifischen Akteuren und Akteursgruppen.

Die öffentliche Kritik erreicht darüber hinaus ein besonderes Ausmaß soziologischer Reichweite, wenn die theoretisch-analytische Kategorie des Dritten in der Bloganalyse konsequent mitgedacht wird. In seiner abwesenden Form erhält der Dritte die Funktion einer Spiegelung gesellschaftlicher Erwartungshaltungen. In der kommunikativen Vermittlung der Clinician Scientists offenbart sich dann eine Kritik an den gegebenen normativen Vorstellungen, mit denen das Individuum in der alltäglichen Handlungspraxis konfrontiert ist. Damit entwickelt sich öffentliche Kritik in den Science Blogs zu einer Kritik an den jeweiligen normativen und konkurrierenden Bezugssystemen. Für eine Analyse des Feldes der TF hat dies folglich die praktische Konsequenz, dass beobachtet werden kann, welche Bezugssysteme auf der individuellen Ebene um spezifische Wertigkeiten konkurrieren und welche normativen Verschiebungen sich hier abzeichnen.

Ferner folgt aus den hier entwickelten analytisch-empirischen Überlegungen, dass scheinbar ‚unscheinbare' Kommunikationsformate wie (Science) Blogs in fruchtbarer Weise für die Soziologie der Kritik aufbereitet werden können und vor diesem Hintergrund zum Spielfeld politischer Handlungen avancieren. Demnach ist die Praxis der öffentlichen Kritik mit ihren politischen Konsequenzen nicht mehr nur spezifischen und für derselben typischen Öffentlichkeitsformaten zugänglich. Eine solche Erweiterung um ‚neue bzw. moderne Orte der Kritik' liest sich durchaus im Sinne des

französischen Pragmatismus. So ermöglicht die Soziologie der Kritik ein politisches Handlungsprogramm für eine Gruppe unterschiedlichster Akteure. Kritik ist demnach nicht (mehr) nur einer elitären Gruppe vorbehalten. Vor diesem Hintergrund erscheint es nur konsequent, die Austragung von Kritik auch in analytischer Hinsicht ‚alltagstauglich' zu gestalten. Das heißt, Kritik auch in jenen Orten analytisch zugänglich zu machen, deren Zugriff sich niedrigschwellig(er) gestaltet als jene klassischen Orte öffentlicher Kritik wie bspw. den (Tages-)Zeitungen und/oder öffentliche Protestsituationen (Bogusz 2010).

5 Science Blogs as critique – Bilduing Public Identities in the Field of Translational Research

5.1 Abstract[22]

Clinician scientists are pivotal figures in translational research. Although the discourse on translational research is favorable to clinician scientists, their role within it and their view of themselves has received little attention. In this exploratory study, we attempt to analyze the view of clinician scientists on translational research by drawing on surveillance studies and the pragmatic sociology of critique and examining the potential for critique of science blogs. From analyzing science blogs and the blogging selves they represent, we find a fundamental dilemma of being torn between the two worlds of clinic and research. Although translational research seeks to support clinician scientists, it intensifies this conflict even further. The arguments of clinician scientist-bloggers are emotionally charged with feelings of contradiction, unpredictability, and skepticism. These feelings undergird a critical agenda that shows indignation as the result of being a pivotal figure in the discourse on translational research.

5.2 Introduction

Calls for fundamental changes in the organization of research practices in the biomedical field are clearly discernible, and the calls to enact these changes are notably directed at clinician scientists. Claims of serious deficits in the

[22] Dieses Kapitel ist eine Preprint-Fassung des veröffentlichten und zitierbaren Beitrages: Hendriks, Barbara, Reinhart, Martin (forthcoming): "Science Blogs as Critique – Building Public Identities in the Field of Translational Research". In: Science & Technology Studies. Online first: 09.04.2019.

innovation process and of inefficiencies in research practices ("waste") have been brought forward and linked to roadblocks in the translation from research findings into effective clinical practice. Commonly referred to as a "translation gap," a more general shift in the discourse is apparent that emphasizes the term "translational research" (Contopoulos-Ioannidis et al. 2003). Multiple stakeholders refer to translational research in order to address questions regarding the reorganization and improvement of biomedical research practices. These questions range from methodological, e.g. regarding reproducibility or randomization of experiments, to organizational, e.g. regarding interdisciplinarity and interorganizational communication, to regulatory issues, e.g. regarding guidelines based on meta-reviews or additional funding for regulatory staff. For these questions one group of actors promises to hold the necessary interactional expertise and to carry the translational shift: clinician scientists. Fulfilling two roles at once, the clinician scientist is perceived as the essential conduit between biomedical research and clinical practice (Lemoine 2008).

The expectation of fulfilling two roles in one is an excessive demand on everyday practice and results in "situations of crisis" (Boltanski and Thévenot 1999) for individual clinician scientists. Solutions to the crises are left up to the individuals, due to the fact that clinician scientists do not represent an independent profession with institutional platforms, e.g. the Office of the Profession in New York (US) (http://www.op.nysed.gov/), (educational) departments and systems, or rules of professional conduct for justifying needs and concerns. However, one platform where such professional issues can be discussed and observed are science blogs, of which there are a sizeable number authored by clinician scientists. Multiple studies have called attention to the fact that blogging contributes to the empowerment (Farrell and Sides 2010; Farrell and Drezner 2008) and development of professions (Samia Ezzamel 2013; Sarah Bodell et al. 2009).

Our interest lies in how clinician scientists participate in the discourse on translational research and how their role as clinician scientists is performed by speaking out with respect to their individual crises as a form of critique. An active community of clinician scientists publicize their daily working practices,

challenges and tasks in the context of translational research on science blogs. In the tradition of science communication research (Bucchi 1998; Shanahan 2011; Bonetta 2007; Kouper 2010), we focus on the meaning of new media forms for scientific practice. We provide an exploratory analysis of these blogs with respect to three questions: How do clinician scientists describe and problematize their position? How do they contribute to the discourse on translational research? How do science blogs provide a venue for critique in the public context of translational research? In answering these questions, we contribute to the ongoing debate on the role of new forms of science communication, such as science blogs, in building public scientific identities. Following a neo-pragmatist perspective (Boltanski and Thévenot 1999), we performed a three-tiered analysis disclosing self-images of clinician scientists: We find that (1) clinician scientists see themselves in a dilemma between the two worlds of clinic and research, leaving them too little time to be simultaneously successful as researchers and as clinicians. (2) Translational research as a professional framework remains vague and devoid of guidance for translational practice, thus, exacerbating this conflict. (3) Being a pivotal figure in the discourse on translational research, blogging clinician scientists present themselves as affected by contradiction, unpredictability, and skepticism. As a result, their professional agenda is articulated in a mode of critique based on indignation.

5.3 THE CRISIS IN BIOMEDICAL RESEARCH

The discourse on translational research has its roots in the USA, which is well reflected in the development of the journal landscape on translational research in biomedicine (Blümel et al. 2015). As such, the recent history of translational research is strongly tied to the North American context, from where it has spread globally over the last two decades. The wide spread has, partly, been made possible by the fact that the term translational research remains unspecific and malleable (Butler 2008). Translational research functions as an empty signifier in most situations, for instance, as it does not contain any specific

practical advice for "doing translation". Translational research as a research framework has thus developed an overall global character. Its compatibility allows various stakeholders from different nations, institutions, and research fields to take part in the discourse and to voice their agenda through translational issues (Krüger et al., forthcoming).

A brief history of the emergence of translational research within the last four decades has to take note first of increased efforts and investments into research and development (R&D) in the field of biomedical research while simultaneously the output of novel therapies has been declining (Wehling 2008; Center Watch 2016). Investments in R&D in biomedicine rose from $13,6 billion to over $27 billion from 1993 to 2003 and led to higher expectations for innovation, which has largely resulted in disappointment (Kraft 2013; Pisano, 2006). Diagnoses of innovation deficits in the pharmaceutical industry and of declining approval rates for drugs and therapies have been prominently cited since the 1970s (Kraft 2013). The National Institutes of Health (NIH), the US medical research agency, problematizes this issue by stating that "[a] novel drug, device or other invention can take about 14 years and $2 billion to develop, with a failure rate exceeding 95 percent" (https://ncats.nih.gov/about). As a consequence, the improvement and acceleration of the translation from research findings into clinical practice has become one of the most important issues in biomedicine "as one of the reasons for this widening gap between input and output is the difficult transition between preclinical ('basic') and clinical stages in the R&D process" (Wehling 2008). These unique developments indicate fundamental changes in the way research is organized in the biomedical field. How to improve translation has thus become a prominent question with the spotlight on the transition from preclinical to clinical research and practice.

The issue of translation is controversial, and an expanding literature identifies numerous problems and possible causes (Drolet and Lorenzi 2011; Mittra and Milne 2013; Blümel et al. 2015). Especially influential was a series of articles published in The Lancet under the headline "Research: increasing value, reducing waste" in January of 2014. A limited number of specific roadblocks for successful translation were emphasized and attributed to "lack of

methodological skills, research design and analysis" (Macleod et al. 2014), "publication bias towards the publication of positive research results" (Glasziou et al. 2014), "decisions about research funding" (Chalmers et al. 2014), "issues in research management and regulation" (Salman et al. 2014), and "the role of fully accessible information of biomedical studies" (Chan et al. 2014). Recommendations for solving these problems are as varied and numerous as the multitude of issues in the discourse on translational research in general. The stratified nature of the discourse, comprised of heterogeneous sets of definitions of the problem(s), of causes for failing translation, and of necessary measures creates fertile ground for attempts to reduce or shift this multilayered discourse towards unitary concepts that promise to cut through the tangled and puzzling discursive situation. A solitary figure, such as the clinician scientist, promises to be responsible and effective in managing the seemingly unmanageable complexity in translation and thus provides an attractive one-size-fits-all solution.

5.4 THE CLINICIAN SCIENTIST

Who are these clinician scientists and why do they seem so promising at cutting through the layers in the discourse on translational research? In the simplest case, clinician scientists are those rare professionals in the biomedical field holding both an M.D. and a Ph.D. who also work both in clinical care and medical research. Ideally, the time between both areas is evenly split. In general, a more specific and agreed upon job description is not available, and the definition of clinician scientists varies between different national and thus regulatory contexts as well as between different training and funding programs based on specific institutional strategies. However, in order to set a rather consistent definition who clinician scientists are, we follow Zemlo et al. (2000) in defining those individuals as clinician scientists who are working in the clinic, at the bedside, while also performing and understanding research as an essential activity in their professional role, at the bench (Zemlo et al. 2000). As such, clinician scientists represent a minority as most scientists producing knowledge

relevant to clinical healthcare are not active in clinical practice and most clinicians have no practical link between their work with patients to relevant research projects (Lander et al. 2010).

The practical link between research and clinic provides the source for the clinician scientist' status as the essential conduit to translation. In contrast, "pure" scientists and clinicians seem to be lacking the necessary interactional expertise to bridge the translational gap. Policymakers and educators have discussed the clinician scientist in this key role for translational research intensively (Garrison and Deschampes 2014) and a focus on the professional role of clinician scientists has spread from the United States to various countries in Europe—especially Germany (DFG 2015) and the United Kingdom—as well as to Asia (Woo et al. 2011; Sakushima et al. 2015). As a consequence, educational programs to develop clinician scientists as a professional group and targeted funding strategies were implemented. The overall expectation is that clinician scientists "are able to bring their research from bench to bedside, and they are also uniquely capable of doing the reverse—incorporating results of clinical studies into new research and treatment approaches" (Roberts et al. 2012, 267). Thus, we find an increasing demand within science policy to (re-)professionalize the clinician scientist (Vignola-Gagné 2013; 2014).

Although the clinician scientist is perceived to be the one capable of successfully translating research findings into clinical practice, the number of clinician scientists is still low (Milewicz et al. 2015). The proportion of physicians engaged in research in the US declined from 3.6% in 1982 to 1.6% in 2011 (Morel and Ross 2014), but different funding and training strategies to promote the clinician scientist aim at counteracting the decline. To put these numbers in context, some historical developments are helpful: Combining research and medical practice has a long tradition, with roots going back to classical antiquity (Schafer 2009; Rosen 2011). Until the 1970s, biomedical and clinical research were tightly linked, and research was mainly performed by clinicians. Medical research was mostly done by so-called physician scientists, who were also responsible for patient care (Butler 2008; Roberts, Scott et al. 2012). The number of clinicians in research decreased from the 1970s onward

as a result of structural changes: "[B]iomedical research emerged as a discipline in its own right, with its own training. The bulk of biomedical research is now done by highly specialized PhD scientists […]" (Butler 2008, 841). Biomedical research and medical practice got separated, and the clinician scientist became a minority.

Many stakeholders saw the marginalization of the clinician scientist as a challenge and called attention to the problem that they might completely disappear. James B. Wyngaarden—who would later become director of the NIH (NIH 2015)—was the first to raise awareness of the tremendous decline in the number of research training fellowships for M.D.s (Wyngaarden 1979; Garrison and Deschampes 2014). In 1984, under the headline "The End of the Physician Scientist?", Gordon N. Gill pointed to economic and intellectual changes that made research much less attractive for young physicians, causing further decreasing numbers of clinician scientists. Physicians who engaged in research had increasingly been drawn to laboratory research (Gill 1984; Garrison and Deschampes 2014). The situation seemed unchanged in 1999 when Leon Rosenberg wrote that "there is a defect in the structure of the country's medical research edifice, which must be repaired soon [...which is...] the progressive, dangerous decline in the number of physician-scientists" (Rosenberg 1999, 331). Rosenberg found a growing burden on medical school graduates, an increased length of postdoctoral training, and an instable research career to be the main factors for the decreasing number of physicians participating in biomedical research (Rosenberg, 1999).

The decline of clinician scientists has been analyzed as a problem that had either individual (Lowy 1987; Lemoine 2008; Kraft 2013) or structural (see e.g. Morel and Ross 2014) causes, but few studies have dealt with how clinician scientists portray their role in the wider biomedical research environment, especially in the context of translational research. Exceptions are studies from Wilson-Kovacs and Hauskeller (2012) addressing the clinician scientist' self-image in the biomedical research context, Vignola-Gagné (2014) discussing the paradigm shift to translational research as a cause for self-empowerment, and Brosnan and Michael (2014) addressing the centrality of the clinician scientist figure in visions for translational neuroscience. We follow up on this line of

research. Since the clinician scientists take center stage in the discourse on translational research, their self-image is of strategic importance and can give insights into hurdles and barriers regarding their professional situation and development. The few clinician scientists giving voice to their profession have a high probability of being heard in the wider context of translation and of influencing the construction of problems and solutions in the discourse. We thus ask how clinician scientists portray themselves, what kinds of problems they experience, and how they criticize their biomedical research environment? Answering these questions empirically with an explorative approach by analyzing blogs from clinician scientists allows us to provide insights regarding the ways clinician scientists present a professional self-image and regarding the potential of blogs to provide forms of critique in a digital media ecology.

5.5 Decentralized panopticism and critique from blogging selves

We construct our identities in a media ecology and in societies that have seen significant technological change. Many have argued that the technologies through which we present, represent, and ultimately know ourselves are so pervasive as to amount to societal conditions of visibility (Brighenti 2006; Turkle 2005), surveillance (Lyon 2014), and vigilance (Staples 2013) that can be called decentralized panopticism (Hörl, 2011; Maasen and Sutter 2016). Our subjectivity emerges more and more through interactions with technological objects and networked platforms: smartphones, computers, implants, trackers, Facebook, blogging, etc. (Massen and Sutter 2016, 176). These put us in heterogeneous actor networks that are characterized by spatio-temporal immediacy (Thompson 2005). Our communications have audiences beyond our accustomed frames of reference in social space and time (Lyon 2014). As a consequence, our subjectivity and our identities are the product of collaborative cultures of users in which we participate and which we control through our "blogging selves" (Lovink 2012). These are not just what we know and do but also what we feel, as they "express personal fear, insecurity, and disillusion […]

and unveil doubts and insecurity about what to feel, what to think, believe, and like" (Lovink 2008, 17 f.).

Our communication within these socio-technical infrastructures may seem trivial or old-fashioned individually, e.g. when the content of our blog posts amount to nothing more than what we wrote in our diaries long before the internet was invented (Nardi et al. 2004) or when we post family pictures on Instagram that are the same ones we used to put into albums on our book shelves. But because the current socio-technical infrastructures give us less visibility as to when and by whom we are seen and read while at the same time maximizing our visibility to others, our blogging selves engage in "self-fashioning" (Greenblatt 1980). We construct our identities self-reflexively and artfully to account for media ecologies in which we see and are seen through a decentralized panopticon (Maasen and Sutter 2016). By drawing on the tradition of surveillance studies and emphasizing the world of blogging selves as a decentralized panopticon, the setting in which critique, as a specific form of communication, takes place can be seen as complex and omnipresent. Bloggers are, at least partially, agnostic about who is "watching" and "judging." Critique then has to be articulated in ways that are compatible to various and undefined audiences (Hendriks 2018) which advances types of professional identity building that are geared towards the global. The analysis on the basis of a decentralized panopticon is thus directed towards the global professional stance of clinician scientists.

In the current digitally networked media ecology, our blogging selves are what we use to participate and create communities (Davies and Horst 2016a) and through which values are enacted that may form the basis of social movements and collective political action (Davies and Horst 2016b). Blogging selves thus produce critical moments, and science blogs are places where the blogging selves of scientists provide critique that draws on scientific values. To test empirically how science blogs are a venue for critique that is based on scientific values, we extend surveillance studies by drawing from the neo-pragmatist sociology of critique established by Luc Boltanski and Laurent Thévenot (1999).

The pragmatist tradition within the sociology of critique pays close attention to critical moments as situations in which the conflict between different actors plays out verbally. The conflicting parties draw on their reflexive capacities in order to justify their positions. People have the reflexive ability to distinguish between "world" and "reality" and thus to define how the world should ideally be (world) and how it actually is (practice) (Boltanski and Thévenot 1999). Criticizing is thus a reflexive practice in that blogging selves are fashioned in reaction to those social circumstances that trigger indignation; that again, is constituted by the cognitive differentiation of world and reality. Various aspects of sociality are processed through the bloggers perspective and form a blogging self that represents social reality and its critique through self-fashioning. By describing the world in which the blogger is involved, states of how the world is and how it should be are made visible and form critical moments. What is rare, however, is that blogging involves a dispute between different parties invoking different orders of worth to justify their respective views. The way Boltanski and Thévenot stipulate that disputes are resolved, either by one order of worth winning over the other or by building compromises (Boltanski and Thévenot 1999, 374), seem equally rare in the context of blogs[23].

Blogs are public forms of interaction in which orders of worth are articulated, but the ways they produce critical moments and the means with which they provide justification are different from the pragmatist model within the sociology of critique. Interaction through blogs allows for communication that is not restricted by co-presence in space and time. The setting in which blogging selves articulate themselves hardly resembles the ideal public situation for discourse with face-to-face interaction and, as argued above, is better described as a decentralized panopticon. As a consequence, communication on blogs is not necessarily committed to justification and commonly shared orders

[23] Siehe Kapitel 4 in dieser Arbeit für eine theoretische, und empirisch untersetzte, Perspektive zur Analyse von Disputen in Science Blogs, die konkreter an die theoretisch-analytischen Setzungen von Boltanski und Thévenot (1999; 2007) anschließen; mit der Voraussetzung, dass die Rechtfertigungen induktiv aus dem empirischen Material gewonnen werden.

of worth and is better described as self-fashioning in a mode that is based on justified indignation. Critique thus takes the form of self-images that are placed within a discourse in which they function as symbols or objects that can be used as one element in justification. We suspect that the blogs of clinician scientists are just such objects, and ones that take a central position in the discourse on translational research. Their potential for critique lies not in convincingly argued justifications but in making visible blogging selves that are committed to common scientific as well as clinical values. As a consequence, their daily struggles or frustrations become objects the translational discourse has to contend with.

Blogs, however, do not merely represent forms of identity building, e.g. in terms of blogging selves, they further can give insights into the configuration of power relations and moral values within scientific practice (Lancaster 2016; Meskus et al. 2018; Hesselmann et al. 2016).

5.6 METHOD, DATA, AND ETHICS

We sampled science blogs within the "web sphere" (Schneider and Foot 2005, 158) related to translational research and written by clinician scientists. In general, science blogs are numerous and provide plentiful material. Riesch and Mendel (2013) categorize them into four types of science blogging, whereby individual blogs usually contain elements of more than one type. Mainstream media blogs such as "Guardian Science"[24] and the BBC blog "Goes the Theory"[25] comprise the first type. Second are institutional blogs, e.g. the "Institute of Hazard, Risk and Resilience Blog"[26] and "Cancer Research UK –

[24] https://www.theguardian.com/science/series/science-blog-network

[25] http://www.bbc.co.uk/blogs/tv/2012/03/bang-goes-the-theory.shtml

[26] http://ihrrblog.org/

Science blog"[27]. Third are blogs written by practicing scientists addressing their own academic research. Fourth, and most relevant to our case, are blogs that are only partially perceived as science blogs as they are written by scientists but raise issues that are personal and relate only peripherally to their own academic research but centrally to their working experiences. The "Jack of Kent blog"[28] is an example for this category, which gained prominence among science bloggers for the analysis of the Singh libel case. For our study, we selected blogs and blog posts that were written by clinician scientists and that contain "personal issues," in line with the fourth type from Riesch and Mendel. The contexts (institutional, mainstream, or private) vary among these blogs.

We started our web search for blogs on the website "Top 100 Science Blogs on the Web"[29] and used a "snowball strategy" mainly through hyperlinks. We collected individual blogs that are hosted by scientific blog networks. In a first step, we collected blogs discussing the concept of translational research in general. In a second step, we reduced the sample to blogs that were written by clinician scientists discussing translational research with respect to their daily working practice, which limited the sample to 32 blogs (see tab 8). The self-description of the blogger had to contain the keywords "clinician scientist," "clinical scientist," or "physician scientist." The sampling strategy further aimed to collect blogs from clinician scientists from diverse biomedical disciplines, diverse job contexts, and job positions as well as institutional settings and national contexts in order to provide insights into a widespread, even global, clinician scientist self-fashioning.

The sample contains research contexts from hematology, oncology, psychiatry, psychology and behavioral science, cancer research, cardiology, and pharmacology. The identified career positions are professors and assistant professors working in university hospitals, research coordinators in

[27] http://scienceblog.cancerresearchuk.org/

[28] http://jackofkent.com/

[29] https://blog.feedspot.com/science_blogs/

governmental institutions, and medical doctors doing their Ph.D. or other research training programs. Not all job positions could be identified. Some of the bloggers also write for newspapers (e.g. "Huffington Post" and "The Guardian") and science magazines.

Table 8: Coded science blogs

Scientific blogs / networks	Blog posts	Words	Comments
Scientific American Blog Network	1	2411	2
Mind the Brain	1	1547	4
BioMedCentral	4	6148	9
Kevin MD.com	1	1727	5
Science Blogs	5	22035	43
Academic Matters	1	1995	0
PLOS Blogs Network	2	3607	8
Nature.com Blogs	1	1278	1
Psychology Today	4	4687	1
Psychometrics Forum	1	864	0
Asian Scientist	1	799	0
Science Mag (AAAS)	1	1794	0
Broad Institute MIT, Harvard	1	788	0
Research Forum India	1	783	2
Give Well Blog	1	3041	1

One Earth Future	1	1150	0
Queens University	1	608	0
Science-Based Medicine	1	5128	0
Psychometrics Forum	1	864	0
Private Blogs/Other	2	4659	0
Total	32	65913	75

The most frequent topics within the blogs are the non-compatibility of clinic and research, dealing with working requirements in hospitals (workload and patient care), dealing with research (demands and needs for successful research), education and training (medical degree and clinician scientist program), the economic situation (doctor salary and research funding), and work-life balance.

We selected posts that were published between 2009 and 2016, a time when discourse on translational research in (bio)medicine was already widespread. Blog authors are from the United States of America, Canada, the United Kingdom, India, and China. Most are written by male authors, in line with the underrepresentation of women among clinician scientists (Andrews 2002; Ley and Rosenberg 2002; Rosenberg 1999; Andriole et al. 2008), resulting not from less women entering a career as a clinician scientist but from more women dropping out.

The number of blog posts within any single blog varies as some platforms host more clinician scientist blogs than other platforms, such as "BioMedCentral" or "PsychologyToday." It is up to the blogger on which platform they post, but we assume that platforms specialized for a biomedical and psychological audience are more often used from clinician scientists than other blogs that are not specialized for biomedical research, such as "Nature" blog.

Judging from language use and content, the blogs address an anglophone audience with professional biomedical knowledge. In most of the science blogs, a commentary function was available in which anonymous bloggers could comment on the main blog text or previous commentaries. Judging from the comments, the readers seem to hold similar job positions such as clinicians, researchers, medical students, or clinician scientists. Re-comments from clinician scientists were included in our qualitative analysis.

Analytically, we proceeded in two steps. First, we extracted information about structure, issue, length, and wording with linguistic methods (Hewson et al. 2003). Second, a qualitative content analysis (Mayring 2000) was used to develop appropriate codes inductively and formed the main basis for the interpretation. The coding process was technically supported by the qualitative data analysis software MAXQDA. To ensure reliability of codes, the authors discussed data and findings frequently in common sessions. Due to the exploratory and inductive approach, part of the analysis was to build a suitable coding scheme through an iterative process. Parts of the material were coded; the emerging codebook was discussed and revised; further parts of the material were coded; the codebook was revised again, until both authors agreed that a point of saturation was reached (for the codebook see appendix tab 2).

Even though our material consists of publicly available blog posts we, nonetheless, aim to protect the identity of the bloggers as much as possible. Despite a wider discussion on research ethics in online research (Jones 1994; Bordia 1996; Buchanan 2004; Hewson et al. 2008), a consensus on which web material should be seen as "private" is missing (Hookway 2008). We did not request permission from the bloggers to use their blog posts as data but pseudonymized the quoted passages.

This study uses an exploratory approach attempting to reveal critical stances from blog posts published by clinician scientists independently from their nationality, gender, or training program in order to give valuable insights about the overall constitution of the professional identity of clinician scientists. Our approach provides a suitable way for the identification of the professional situation of clinician scientists via their public critique that is revealed by their blogging selves, but it also has some limitations. The most critical one is that

our study is limited to a small group of clinician scientists who blog actively and problematize their situation as clinician scientists in the daily practice. This study therefore does not provide insights from those clinician scientists who are not active in blogging, and thus their perspective remains invisible to our study.

5.7 EMPIRICAL FINDINGS

We present and discuss the empirical findings along three lines. In a first step, we outline how clinician scientists establish a critical stance by characterizing and problematizing their own position; this involves specifying what challenges clinician scientists are confronted with. Above all and not surprisingly, much of what clinician scientists problematize can be interpreted as a typical role conflict, in that the blogs voice personal concerns and individual (in)capabilities for action. Second, we reconstruct the patterns of critique indicating a more structural conflict between translation and profession that forms the basis of the role conflict. Third, we integrate the different sources of indignation into a critical agenda for clinician scientists, transforming their self-fashioning into collective political action.

5.7.1 The crisis as an individual role conflict

We find two distinct roles for clinician scientists that correspond to the two worlds of research and clinic. The bloggers refer to these two domains by describing their work as having to act in "two worlds" or having to "wear two hats." The perception that clinician scientists combine two different domains is common, in fact it defines who they are. It provides the most fundamental premise for the blog posts in that this combination of the two worlds is framed as problematic and the ensuing account draws essentially from this premise. We call this premise "the two-world dilemma": Holding the status of a clinician scientist brings the problem of having to combine two distinct worlds.

Presenting the two worlds of clinic and research as problematic by those having to "wear two hats" implies a partial incompatibility that may make it difficult to form an identity that draws from both worlds. As a consequence, we start with more exploratory questions: How do clinician scientists describe themselves? What seems to motivate them in their daily working practice? What kind of challenges do they present in their blogs? And what do they criticize in that regard?

The clinician scientist bloggers fashion themselves as primarily motivated in their role as physicians rather than researchers or clinician scientists. Motivation particularly comes from being a medical doctor and thus from improving patients' health. Research, as a daily task, is then perceived as something that disturbs the aim of the clinician, to improve the health of their patients in daily clinical situations. Being a clinician predominates, and other professional tasks are evaluated as subordinate to their daily clinical practice. Reproducing the two worlds of research and clinic as distinct leads to a role conflict, and clinician scientists then prioritize the clinic over the lab. A female clinician scientist from psychiatry made the following statement, exemplifying this process:

> "So, soon after starting research training, my unanticipated secondary dilemma became this: committing to conducting serious research appeared to lie in conflict with my desire to be an active clinician. My need to solve important problems in health disparity was, ironically, taking me further from the very patients I wished to serve" (Blog V, 2012, par. 19).

The wish to do research, aimed to "solve important problems in health disparity" (ibid.), takes the clinician scientist physically away from the patients she actually wanted to help. The idea of combining the two worlds is primarily motivated by helping patients right on site, and the struggles in combining the two worlds set in soon after starting research.

These struggles in combining clinic and research have to be overcome by clinician scientists on a practical level but lead to a specific kind of conflict, as the expectations of both roles would have to, in principle, be met in full and separately within the two distinct worlds. We found that clinician scientists,

who represent themselves in science blogs, moreover believe that research and clinic should take an even amount of time, ideally split 50/50. Thus, a reduction of one part, research or clinic, intensifies the conflict. The following statement demonstrates this conflict when research reduces time spent on patient care:

> "I remember this anecdote so well because in my career as a physician-scientist, the two worlds of science and clinical medicine rarely overlap […]. Most of my time is spent in my stem cell biology laboratory [...]. Roughly twenty percent of my time is devoted to patient care, treating patients with known cardiovascular disease in clinics, inpatient wards and coronary care units" (Blog I, 2014, par. 10).

This "time gap" represents a fundamental problem dimension for clinician scientists, because it intensifies the conflict between research and clinic. The time for research and clinic affects the different career paths of both roles. Having to fulfill the requirements of both career paths leads to the circumstance that the clinician scientist always feels they do not have enough time to do both. Time is very often raised in the blogs as a relevant resource in handling the two worlds. From an individual perspective, more time for research seems to be the solution for clinician scientists as more time makes it "easier for physicians to be scientists" (Blog II, 2010, par. 120).

> "People have been moaning about the lack of physician scientists since at least the 1990s when I was in med school. But no one seems to want to enact the obvious solution: make it easier for physicians to be scientists. Make protected time truly protected, [...] make sure hospitals consider time spent in research as service to the university and don't penalize physicians for not seeing patients during that time, etc. Until that happens of course there will not be many physician scientists. If you make it impossible to do something, people won't do it. End of story" (ibid.).

This statement clarifies that provision is made for research time, but in fact this time is not "protected" enough from clinical obligations. Time becomes especially important with respect to career paths when the option of becoming a full-time researcher or going back to being a full-time clinician remains possible. If the clinician scientist wants to be successful, more protected time is needed, so that the career requirements for both roles can be fulfilled

simultaneously. As a consequence, a career choice away from being a clinician scientist—either towards research or clinic—seems to be a solution. Career choice means therefore choosing between a successful career as a researcher or a physician instead of a clinician scientist.

> "But soon after entering the world of research, and much to my dismay, I discovered what I think is another important reason: the physician-scientist who is able to successfully and simultaneously be both active clinician and clinical researcher is indeed hard to find. Embarking upon the competitive and perilous track toward becoming an independent clinical researcher appears to involve a trade-off—a sizable, if not total reduction in the amount of time spent in providing direct patient care. Something, I imagine, is hard for many physicians to stomach" (Blog V, 2012, par. 14).

The clinician scientist career that is fashioned in blogs seems to remain at the edge of two other strong professions either in medicine or science. And both professions contain clear tasks and requirements that have to be fulfilled in daily practice. When clinician scientists reflect on those demands, they conclude that the clinician scientist's career path lacks clear descriptions of unique tasks. The resulting feeling is indignation. A blogger articulates one such challenging situation with reference to the work edited by Andrew Schafer (2009) "The Vanishing Physician-Scientist":

> "[T]he reality, as well as the perception for young-scientists, watching their more established role models attempt to continue in careers as physician-scientists is that most will fail" (Blog IX, 2009, par. 29).

Another clinician scientist remarks that

> "[c]linician scientists are a rare breed. While the experiences one can obtain on this career path are extremely meaningful and rewarding, the path is also fraught with unpredictability. Most medical students prefer clinical jobs which not only provide economic assurance but also the flexibility to decide on their extent of involvement in research" (Blog XVI, 2013, par. 4).

Although the challenges the bloggers express may seem expected and almost stereotypical, they form the most widely shared description of the basic crisis

clinician scientists see themselves in. The two-world dilemma and the time gap provide vocabulary that is understood by all clinician scientist-bloggers. The reason for this vocabulary remaining unspecific we see as an indication that the crisis, on the one hand, is considered larger than can be grasped from an individual perspective and, on the other hand, is not solvable with individual means, such as hybrid forms that allow for simultaneous research and clinical work. The second part of our analysis was thus guided by the following questions: What are indications in the blog posts for the "larger issues" beyond the individual crisis? What are more specific tasks or forms of work that the bloggers see as "doing translation"?

5.7.2 The crisis in the context of translation

The discourse on translation presents clinician scientists as the solution to fundamental translational problems. These include methodological issues such as the lack of individual skills and knowledge with respect to methods. We find that bloggers fashion themselves as the solution to those translational problems in biomedicine:

> "Traditionally, Clinicians diagnose diseases and treat patients whereas, Scientists do the research work […]. However there is a gap between clinicians and the scientists. The clinicians, having spent most or rather all of their time with patients do not know about the various research methodologies, for example RT-PCR or Western Blot. On the other hand, the scientists are not familiar with the patient; they just receive the tissue sample that has to be processed. This is precisely why we need some doctors to become Clinician Scientists!" (Blog XIX, 2015, par. 4).

The bloggers in general "agree that [clinician scientists] are in an ideal position to effect translations from bench science into clinical practice" (Blog IX, 2009, par. 35). However, they also critically note that translation needs more than just a few individuals who speak the two languages of research and clinic. Translation particularly depends on individuals who are able to let those languages communicate:

> "The mark of a good "translator" is not merely the ability to understand and speak both languages—research and medical—but to let the two languages communicate" (Blog XIX, 2016, par. 15).

Doing translation on a professional level means more than just practicing research and clinic side by side. Connecting lab and clinic needs "good translators," especially individuals who are able to transform laboratory work and clinical practice into translational research. With that competence,

> "[c]linician-scientists can be [...] knowledge brokers or bridge builders. In our highly specialized medical and research modern environment, they possess an interesting and much needed profile allowing them to make connections between people and expertise" (Blog XVII, 2015, par. 63).

The discourse on translational research itself demands successful communication between biomedical research and clinical practice in order to provide translation. However, bloggers criticize that biomedicine, despite the fact that it claims translation, does not represent translational research. The two domains of research and clinic are reproduced permanently in daily business. Conferences, for instance, as a potential place for interdisciplinary exchange are highly specialized towards either basic research or clinical practice. These circumstances, when reflecting the gap between reality and world, lead to feelings of indignation as these daily tasks, such as giving talks at conferences, are clearly lacking the aim of translation:

> "Here, instead, I wish to articulate the feeling that these talks evoke in me, a feeling I suspect is shared among countless clinician researchers and even some, yes, if you'll believe it, physician scientists, who might admit this only in private. That feeling is: "No. Please stop. Dear God. Please. Stop. I beg you." […] But, no matter whether you think of molecular medicine as salvation or self-promotion, can we at least agree that the talks are boring? They bore the clinician-physician [as part of the clinician scientist] in all of us who is concerned with how people live in sickness and health and what medicine does, can do, and should do to help them" (Blog VII, 2012, par. 7 – 11).

These critical stances from the bloggers reveal that research and clinic coexist rather than overlap or even intertwine in daily practice. The following statement

reflects the impossibility of furthering a clinician scientist career due to everyday constraints:

> "Clinician scientists no longer drive biomedical research. It is not possible to be truly proficient in both modern clinical care and experimental basic science. In addition, and because they rarely elucidate the latest biological mechanism, their research output will not always be considered as they would have wished by some basic scientists and top tier scientific journals. The constraints of the daily routine of medical practice, including the increasing financial pressure on the health system, lack of time and even the lack of training are major obstacles to the development of broader research activity within academic teaching hospitals" (Blog XV, 2015: par. 56).

Bloggers seem willing to transform daily practices towards translation but blame a clinical environment that seems rigid and not (yet) open for translation. One blogger stated this incompatibility between translational aspirations and established routines succinctly to the point:

> "I am skeptical of some of the arguments people have made for the importance of translational science. These arguments often do not distinguish between different possible definitions of "translational science," and often do not make a strong case that nonprofit funding (as opposed to industry funding) is what's needed. In addition, it seems quite possible to me that the goals of promoting "translational science" might be better served by policy change (on regulatory and intellectual property law, for example) than by [an individual's] scientific research. With that said, I think the idea of translational science is worth keeping in mind, and that certain kinds of research in this category could be under-invested in because they do not fit cleanly into an academic or for-profit framework" (Blog XIV, 2015, par. 52).

5.8 THE CLINICIAN SCIENTIST AGENDA

We started by noting that clinician scientists participate in the discourse on translational research by being seen as pivotal for translational success. As a consequence, the self-fashioning of clinician scientists is more than identity work of an emerging profession; it holds the potential for critique that carries weight. We have seen that the blogging selves of clinician scientists mark a critical moment through the two-world dilemma and the time gap. These critical moments draw from a more complex notion of translation that is rooted in daily working practice. From these more complex notions, it becomes more tangible how the role of science blogs as a platform that allows for transforming individual blogs into a general (embodied) critique. We summarize our findings regarding this landscape of critique by formulating a critical agenda for clinician scientists. This critical agenda is based on indignation, a critical capacity individuals are equipped with, expressed by bloggers individually and by the situation of decentralized panopticism. We find different sources of indignation that relate to the pivotal role of clinician scientists in the discourse on translational research. These reflect the critical stances towards experienced uncertainties in daily working practice:

(1) To be a pivotal figure in translational research triggers feelings of contradiction as it demands a combination of research and clinic in the daily working practice, i.e. translation should be based on the combination of lab and clinic (world), yet combining the two different roles can hardly be fulfilled in everyday work. The worlds of research (publishing, applying for grants, lab supervising, and research projects) and clinical practice (patient care, improving patient health, and clinical duties) are too specialized to combine them successfully in everyday work (reality).

(2) The circumstance that clinician scientists have to act in a highly specialized professional environment that, in particular, rewards either biomedical research or clinical practice (reality) triggers feelings of unpredictability regarding individual career paths. Biomedical research should reward translational practices (world), but rather research and

clinic coexist and do not intertwine in daily practices. These circumstances cause a permanent time gap for clinician scientists, who face the challenge of meeting the requirements of both roles simultaneously in their daily working practice.

(3) Translational research triggers feelings of skepticism, because while it seeks to consolidate research and clinic (world), it actually reproduces both worlds continuously as separate. Translational research lacks regulatory and/or organizational mechanisms to combine research and clinic, which neither offers precise information for the individuals involved on how to practice translation successfully nor rewards translation (reality).

5.9 Conclusion

Translational research promises to solve many of the challenges the biomedical field faces today, and clinician scientists are assigned to a pivotal role in overcoming these challenges. Even though many observers have predicted or analyzed the discourse on translational research as favorable for the clinician scientists to regain professional strength, the critical view of clinician scientists themselves has received little attention. We analyzed science blogs by clinician scientists to describe their blogging selves within the discourse on translational research by paying special attention to their potential for critique.

We found that clinician scientists fashion themselves prima facie in a dilemma between the two worlds of research and clinical practice, which does not afford them enough time to fulfill either role—as researcher or as clinician—sufficiently. By interpreting this conflict in the context of translational research, we find a more deep-rooted professional challenge facing the clinician scientist profession: With its vague definition, translational research does not offer enough guidance on how to practice translation successfully. Leaving clinician scientists with the demand of combining

research and clinic, despite the mismatch between translational ideals and professional guidance.

Despite all the promises and potential of translational research, the view that emerges from blogs of clinician scientists is critical. Their self-fashioning offers forms of critique that rest more on structural rather than individual challenges. The demand of being a clinician scientist is an overall source of uncertainty regarding individual career paths. It provokes a high individual risk of not fulfilling the expectations for either of the two separate career paths. However, clinician scientists accept their role as being responsible individually for making translational research work. Even though much of the discourse on translational research envisions solutions that are organizational, political, or infrastructural, clinician scientists seem trapped in a form of uncertainty that is a double bind: Accept your pivotal role and bear the price of incompatible expectations or redefine the translational in your work and risk losing your pivotal role. Indignation then is the consequential mode of critique that forms a critical agenda when conceptualizing the world of blogs as a decentralized panopticon, a public stage allowing clinician scientists to utter their critique to a wide audience. Showing feelings of contradiction, unpredictability, and skepticism forms a critique of translational research as a source of indignation. These feelings reflect major uncertainties which the individual blogger experiences within their clinician scientist career that result from mismatches between the imagination of translation, as it ideally should be, and the actual practice of translation buried in an existing biomedical research environment. Without losing their pivotal role, this critique is limited to performing blogging selves that are overstrained by uncertainty. However, it remains effective in working to shape this pivotal role in the discourse on translational research.

5.10 APPENDIX

Table 9: Code book

Main categories	**Information in Codes**	**Themes and questions of codes**	**Number of codings (incl. cross coding elements)**
Background Information	Name and origin of blog	How is the blog named? Where is the blog published? And when was the blog released?	113
	Date of release		
	Job position and research field	Which kind of job position does the blogger held? What is the research field of the blogger?	
	Sex (of bloggers and commentators)	Gender of blogger and commentators	

Reference groups	Relevant (named) reference groups	Interpersonal communication, relationships and contacts (e.g. academic staff, clinical staff, family members, etc.)	74
Identity – Defining the clinician scientist	Translational research practice	Working and research context, research conditions, knowledge transfer, collaborations	185
	Expectations regarding clinician scientists	Formal working criteria, working time, overall working conditions, education, work-life-balance	
	Worth and values of TR	Why should we do translational research? Aims of research and clinical practice, contribution for TR	
	Motivation	What motivates blogger to be a clinician scientist?	
Conflicts between research and medicine	Reproduction of two worlds (research and clinic)	In which way are the distinct worlds of clinical practice and research reproduced? How are both worlds thematized? How often are both worlds named?	316
	Self-descriptions and self-definition	How do the blogger define themselves? What are priorities in the identity of clinician scientists?	

	Problem dimensions	What are the main problems by handling the two roles? What are the conflicts regarding each role (research and clinic)?	
	Time dimension	How does the time dimension strengthen the role conflict? What kinds of problems are produced by limited time?	
Total			688

6 Die Einzelstudien im Überblick

Die kumulative Dissertation basiert auf vier Einzelstudien, die im vorliegenden Kapitel zusammengefasst werden. Sämtliche Studien (siehe Übersicht in Tabelle 10) sind im Kontext von Projektarbeiten zum Gegenstand Translation im Lehrbereich Wissenschaftsforschung der Humboldt-Universität zu Berlin und dem Deutschen Zentrum für Hochschul- und Wissenschaftsforschung (DZHW) entstanden. Unter Bezugnahme der Zusammenfassung der vier Studien wird anschließend die Diskussion angeleitet.

6.1 Studie I: Zur Bedeutung Translationaler Forschung in der (Bio-) Medizin

Obwohl Translation in der (Bio-)Medizin im letzten Jahrzehnt in erheblichem Ausmaß an Bedeutung gewonnen hat, diverse Strategien zur organisationalen Umsetzung implementiert (Blümel et al. 2016) und unterschiedlichste Dimensionen im biomedizinischen Erkenntnis- und Entwicklungsprozess adressiert werden (Blümel et al. 2015), bleibt bisweilen unklar, was genau unter Translation zu verstehen ist. Ganz im Sinne von Butler (2008, 841), der dieses Problem wie folgt zusammenfasst: „Ask ten people what translational research means and you´re likely to get ten different answers". Obwohl zwischen der Aussage von Butler und dem heutigen Stand ein ganzes Jahrzehnt liegen und diverse Versuche unternommen wurden, Translation zu definieren (siehe bspw. Wehling 2008; Kraft 2013), bleibt Translation als Begriff weiterhin vage. Vor diesem Hintergrund widmet sich der erste Einzelbeitrag „The multiple meanings of translational medicine. Negotiating medical science" einer systematischen Analyse der vorhandenen Sichtweisen und Interpretationen von Translationaler Forschung im Bereich der (Bio-)Medizin, um so zu einem allgemeineren Verständnis von Translation beizutragen, das die Akteure im Feld über ihre praktische Aushandlung definieren.

Die Studie widmet sich in einem ersten Schritt einer historischen Aufbereitung der begrifflichen Entwicklung von Translationaler Forschung und eröffnet mit ihrem historischen Abriss, dass die Translationale Forschung in differentesten Problemlagen und -situationen im Kontext des biomedizinischen Entwicklungsprozesses verankert ist und entsprechend begründet liegt: Eine seit den 1960er-Jahren von wissenschaftspolitischen Akteuren diagnostizierte anhaltende ‚Produktivitätskrise' (Barden und Weaver 2010) führt zunehmend zu einem biomedizinischen System, in dem die Mechanismen der Übersetzung von Forschung in die Klinik ‚zusammenzubrechen' (Cockburn 2006) scheinen und welches seither von dem Wunsch nach einem „return on investment" (Kraft 2013) begleitet wird. Diesen, vorwiegend auf ihre Kernpunkte reduzierten, Entwicklungsschritten zugrunde liegend ist dabei die zunehmende Spezialisierung von biomedizinischer Forschung und medizinischer Praxis, die überhaupt erst die Diskussion um ein ‚translation gap' zwischen Forschung und Klinik ermöglicht hat. Die Translationale Forschung siedelt sich somit in einem Schmelztiegel an sich differenter Entwicklungen, die zusammengenommen das Translationsproblem beschreiben, wie es heute bekannt ist.

Für die empirische Untersuchung vorhandener Sichtweisen im Rahmen dieser ersten Studie wurden, in einem zweiten Schritt, wissenschaftliche Zeitschriftenaufsätze qualitativ, mittels induktiven Vorgehens, untersucht und systematisch herausgearbeitet: erstens, ‚wer' über Translationale Forschung spricht (Partizipatoren/Rezipienten), zweitens, ‚wie' Translationale Forschung theoretisiert, d. h. von den Akteuren in Anspruch genommen wird (Bewertung), und drittens, welche wissenschaftlichen Bereiche die Translationale Forschung ‚wie' für sich beansprucht (Gültigkeitsbereich). Im Anschluss an Arbeiten von Barbara Czarniawska und Bernward Joerges (1996) zu „Travel of Ideas" und der Arbeit von David Strang und John Meyer (1993) zu „Institutional Conditions for Diffusion" verdeutlicht die Studie im Ergebnis, dass die Translationale Forschung als Konzept trotz seiner Unschärfe so erfolgreich ist, weil es aufgrund seiner Unbestimmtheit (‚Offenheit') von unterschiedlichsten Interessengruppen für differente Problemstellen im biomedizinischen Kontext adaptiert und entsprechend genutzt werden kann.

Gleichzeitig eröffnet die Unbestimmtheit des Begriffs ein Verhandlungsfeld für die im Feld befindlichen Akteure, in dem praktisch ausgehandelt werden kann und muss, für welche Gegenstands- und Problembereiche Translationale Forschung letztlich Gültigkeit besitzt. Translationale Forschung als Begriff wird damit zu einem rhetorisch-politischen Alleskönner, wenn es um die Formulierung von Gültigkeitsansprüchen geht.

6.2 STUDIE II: PROFESSIONELLE TÄTIGKEITSFELDER FÜR CLINICIAN SCIENTISTS

Clinician Scientists werden im Diskurs über die Translationale Forschung gegenwärtig als zentrale Figuren diskutiert, weil sie mit ihrer besonderen Rollenbeschaffenheit die Übersetzungslücke zwischen biomedizinischer Grundlagenforschung und medizinischer Praxis adressieren. Bei genauerer Betrachtung offenbart sich allerdings, dass die Figur des Clinician Scientists, im Sinne eines forschenden Mediziners, bis ins Mittelalter zurückreicht (Schafer 2009), es bisweilen jedoch nicht geschafft hat eine eigenständige Profession herauszubilden – eine verkürzte Beschreibung der historischen Entwicklung vorausgesetzt. Vor diesem Hintergrund widmet sich der zweite Einzelbeitrag einerseits einer systematischeren Erörterung von Rollenerwartungen gegenüber den Clinician Scientists, die im Translationsdiskurs bestehen und andererseits ihrer tatsächlich gelebten Rollenpraktiken. Damit eröffnet die zweite Studie „What are clinician scientists expected to do? The undefined space for professionalizable work in translational biomedicine“ zum ersten Mal eine kritische Beleuchtung von auf der einen Seite vagen Erwartungshaltungen gegenüber dem Clinician Scientist, die anzeigen, wie Translation praktiziert werden soll und die sich direkt aus dem Diskurs speisen, und auf der anderen Seite den permanenten Versuchen, den vagen Erwartungen auf praktischer Ebene gerecht zu werden. Dabei zeigt die Studie, dass Clinician Scientists durchaus Translationspraktiken im Arbeitsalltag vermitteln, es jedoch an institutionellen Arrangements fehlt diese Praktiken, im Sinne einer Professionalisierung, erfolgreich zu implementieren. Als zentrales Beispiel können die fehlenden Anerkennungsmechanismen angeführt werden:

Translationale Forschung als Prozess wird auf der einen Seite von den Akteuren angestrebt und mittels verschiedener Maßnahmen gefördert, auf der anderen Seite haben sich noch keine klaren Reputationsmechanismen herausgebildet, die jene Karrierewege, die auf Translation zielen, auch tatsächlich belohnen.

Um diesem praktischen Dilemma entgegenzuwirken, fragt die Studie in einem weiteren Schritt nach potenziellen professionellen Tätigkeitsfeldern (sogenannte Arenen), die erfolgreich von Clinician Scientists besetzt werden können, sodass eine Neu-Orientierung von der/dem Clinician Scientist – als Kliniker/in und Forscher/in – hin zur/zum „Übersetzenden" (Translator) tatsächlich gelingt. Die Arbeit verlässt damit dezidiert eine neutrale wissenschaftliche Haltung und nähert sich dem Forschungsgegenstand in einer advokativ-vertretenden Weise an, was kennzeichnend für eine neo-pragmatische Herangehensweise steht (Boltanski 2008; Bogusz und Reinhart 2016). Die Studie verweist dabei auf ein praktisches Handlungsfeld, das genuin den Erwartungen an Translation entspricht, bisher jedoch nicht von den benachbarten Professionen Medizin und Wissenschaft okkupiert ist. Als Beispiel für ein solches Handlungsfeld wird die ‚Metawissenschaft' (metaresearch) herangezogen, die Translationale Forschung positiv sanktioniert und gleichzeitig (noch) so offen in ihrer praktischen Konstitution ist, dass Translationspraktiken von den Akteuren selbst entwickelt werden können.

6.3 Studie III: Science Blogs als Kommunikationsformat öffentlicher Kritik

Durch ihre Unbestimmtheit, oder anders formuliert Offenheit, erzeugt Translationale Forschung ein spezifisch emergentes Handlungsfeld, wodurch sie zugleich einen Handlungsspielraum für (Um-)Verteilungskämpfe eröffnet, die sich in den diskursiven Erwartungshaltungen einzelner Interessensgruppen spiegeln. Auf der praktischen Ebene münden diese Erwartungshaltungen, sofern sie nicht reibungslos übersetzt werden können, in konkreten Konfliktsituationen. Die Erwartungshaltung wissenspolitischer Akteure, die

eine Zusammenführung von biomedizinischer Forschung und klinischer Praxis auf individueller Ebene adressiert, führt bei den Betroffenen zu Konflikten im praktischen Handlungsalltag, weil sie herausgefordert sind (Situationen der Prüfung), die beiden auf Medizin und Forschung basierenden Rollen miteinander zu vereinbaren. Dies gelingt, empirisch betrachtet, nicht reibungslos. Vor diesem Hintergrund widmet sich der dritte Einzelbeitrag „Virtuelle Identitäten. Science Blogs als Kommunikationsplattform öffentlicher Kritik" der Frage, wie die subjektiv erlebten Konfliktzustände im praktischen Handlungsalltag in den Diskurs zurückgespiegelt werden können? Die Arbeit argumentiert dabei, dass eine Translation, die über Akteure, d. h. qua persona konstituiert wird, keine ausreichenden institutionellen Arrangements schafft, über welche die von den Akteuren formulierte Kritik an geltende Zustände öffentlich zugänglich formuliert werden kann.

Science Blogs bilden vor diesem Hintergrund eine geeignete Plattform, um Konfliktpotenziale einzelner Gruppen herauszuarbeiten. In ihnen findet eine Verarbeitung vorhandener Konflikte durch eine kommunikative Vermittlung von Erlebtem in Form von tagebuchartigen Einträgen statt. Dabei werden Teile des Erlebten in der Ich-Perspektive in die Öffentlichkeit transportiert. Ihr Öffentlichkeitsbezug macht sie sodann für eine Soziologie der Kritik (Boltanski und Thévenot 2007) interessant, da die öffentliche Verhandlung individuell erfahrener Rollenkonflikte, die Teil des individuell Erlebten sind, in eine Form der öffentlichen Kritik transformiert wird. Science Blogs beinhalten eine kritische Urteilskraft, verweisen auf einen Handlungs- und Wertepluralismus und bedienen sich konkreter Rechtfertigungsprinzipien.

Die öffentliche Kritik erreicht darüber hinaus ein besonderes Ausmaß soziologischer Reichweite, wenn die analytische Kategorie des Dritten (Simmel 1908; Lindemann 2010) konsequent mitgedacht wird. Tertiarität muss dabei systematisch hinsichtlich ihrer An- bzw. Abwesenheit unterschieden werden. Der Beitrag verdeutlicht in diesem Zusammenhang, dass die Konzeption des nicht-anwesenden Dritten die tagebuchartigen Einträge in einen Zustand öffentlicher Kritik transformiert, die normativen Gerechtigkeitsansprüchen gleicht. Science Blogs werden damit zu einem Ort, an dem sich systematisch die von den Akteuren formulierten Gerechtigkeitsansprüche empirisch

aufzeigen lassen und begründen dergestalt ein politisches Instrumentarium für Identitätsbildungsprozesse.

6.4 Studie IV: Identitätsbildung im Feld der Translationalen Forschung

Ein diskursiver Rückbezug von erlebten Repressionserfahrungen kann über öffentliche kommunikative Vermittlungen vollzogen werden. Science Blogs erweisen sich dabei als einen geeigneten Ort für eine derartige Vermittlung, weil sie trotz ihrer einfachen Zugänglichkeit eine spezifische und für die Soziologie relevante Reichweite entwickeln. Bisher sind jene Konfliktfelder, die von Clinician Scientists gegenüber Translationsdynamiken auf derartigen öffentlichen Plattformen verbreitet werden, unberücksichtigt geblieben. Die vierte Einzelstudie „Science Blogs as Critique – Building Public Indentities in the Field of Translational Research" verfolgt vor diesem Hintergrund das Ziel, die öffentliche Inszenierung einer Professionskrise über die in Science Blogs vermittelten Empörungszustände zu erheben.

Die Studie konzipiert den internetbasierten Raum als ein dezentrales Panoptikum (Maasen und Sutter 2016), in welchem sich die von den Individuen getätigten Aussagen der Kontrolle jedes Einzelnen entziehen. Damit verlassen die von den Akteuren formulierten Selbstbeschreibungen ihren einstigen tagebuchartigen Charakter und transformieren sich über die Infrastruktur des Blogs in eine öffentliche Identitätsbeschreibung. Empirisch wird deutlich, dass Clinician Scientists ihre Translationserfahrungen auf einer, für den Adressaten leicht anknüpfungsfähigen, Ebene als Anforderung ‚zwei distinkte Welten' miteinander vereinbaren zu müssen, beschreiben. Diese Anforderung ist dabei permanent von einer subjektiv empfunden Zeitknappheit begleitet. Auf diese Weise ergeben sich zwischen den Rollen Forschung und Medizin zentrale Konflikte, die sich zwar partiell, aber nicht von Dauer über Kompromisse lösen lassen.

Kontrastiert man die Herausforderungen hinsichtlich des Rollenkonflikts mit den Alltagserfahrungen zu Translation, werden spezifische

Repressionserfahrungen deutlich. Translation wird für die betroffenen Akteure als eine, die individuellen Handlungen strukturierende Form von Umwelt erlebt, die Empörung verursacht und damit zentrale subjektiv erlebte Unsicherheiten im Professionszustand des Clinician Scientists für die Öffentlichkeit zugänglich offenbart: Translationale Forschung fördert erstens Gefühle des Widerspruchs, weil sich die Erwartungen an eine Verbindung der beiden Rollen Forschung und Medizin auf praktischer Ebene nicht erfüllen lassen; sie ist für die Akteure zweitens eine Quelle von Unvorhersehbarkeiten, weil sie keine adäquaten Karrierewege für Clinician Scientists bereitstellt; und sie verursacht drittens Gefühle des Skeptizismus, weil sie vorgibt Forschung und Medizin zusammenbringen zu wollen, die beiden Bereiche Medizin und Forschung im praktischen Handlungsalltag jedoch permanent reproduziert.

Tabelle 10: Übersicht der Einzelstudien

	Titel	**Forschungsfragen**	**Methoden**	**Daten**
I	The multiple meanings of translational medicine. Negotiating medical science.	Wie ist Translationale Forschung historisch entstanden? Wie wird Translationale Forschung im Feld der Biomedizin verhandelt?	Qualitative Inhaltsanalyse basierend auf einem induktiven Vorgehen	247 wissenschaftliche Zeitschriftenaufsätze, die Translationale Forschung verhandeln
II	What are clinician scientists expected to do? The undefined space for professionalizable work in translational biomedicine.	Welche Erwartungshaltungen bestehen gegenüber Clinician Scientists? Welche translationalen Praktiken werden vom Clinician Scientist vollzogen? Wie lässt sich eine Clinician-Scientist-Profession stärken?	Qualitative Inhaltsanalyse basierend auf einem deduktiven Vorgehen, Diskursanalyse, Häufigkeitszählungen	78 leitfadengestützte Interviews und Rankings (basierend auf Q Methode); 148 wissenschaftliche Zeitschriftenaufsätze, die das Berufsbild des Clinician Scientists verhandeln
III	Virtuelle Identitäten. Science Blogs als Kommunikationsformat öffentlicher Kritik.	Wie lassen sich Identitätskonzeptionen in Blogs konstituieren? Welchen Beitrag leistet öffentliche Kritik bei Identitätsbildungsprozessen im Kontext Translationaler Forschung?		Science Blogs, die von Clinician Scientists veröffentlicht wurden und Translationale Forschung als Alltagspraxis zum Gegenstand haben (dienen zur beispielhaften Darstellung und Überprüfung der formulierten theoretischen Ansprüche)
IV	Science Blogs as Critique – Building Public Identities in the Field of Translational Research.	Welche Formen öffentlicher Kritik werden von Clinician Scientists in Bezug auf Translation geäußert? Welche Formen der Empörung löst Translation auf Ebene der Betroffenen aus?	Qualitative Inhaltsanalyse basierend auf einem induktiven Vorgehen	32 Blogeinträge, die von Clinician Scientists veröffentlicht wurden und Translationale Forschung als Alltagspraxis zum Gegenstand haben

7 DISKUSSION: PROFESSIONSENTWICKLUNGEN IM KONTEXT IHRER KRISE

Die Frage nach der professionellen Konstitution des Clinician Scientists wird in der vorliegenden Arbeit dezidiert im Kontext von Translationsdynamiken entwickelt. Translationsdiskurs und praktische Bewältigung werden dabei in einem engen Wechselverhältnis gedacht. Für ihre Akteurszentrierung bedient sich die vorliegende Dissertationsarbeit einer neo-pragmatischen Perspektive, die es erlaubt, die auf der individuellen Ebene geäußerte Empörung gegenüber den im Translationsdiskurs erfahrenen Repressionen herausarbeiten zu können. Die analytische Lücke zwischen individueller und struktureller Ebene wird hier überwunden, indem das Individuum zu einem Akteur wird, der Repressionserfahrungen situativ mittels Diskurs erfährt, dessen Verarbeitung in den Handlungen zum Ausdruck bringt und die gemachten Erfahrungen dadurch an seine Umgebung zurückspeist. Translation wird damit als konstitutives Element in der professionellen Beschaffenheit des Clinician Scientists gedacht und zwar als ein Element, das in Bezug auf die Professionsentwicklung durchaus destabilisierend wirken kann. Dieser Gedankengang erscheint in der wissenschaftlichen Auseinandersetzung mit diesem Gegenstand ungewöhnlich, insofern Translation auf einer oberflächlichen Ebene auf eine Unterstützung der Entwicklung eines Clinician-Scientist-Berufsbildes zielt. Mithilfe derartig formulierter Setzungen, wie sie in dieser Arbeit vorgenommen werden, wird die Frage nach einer möglichen Professionskrise relevant.

Zur Herleitung und Beschreibung des hier eingeleiteten Arguments fasse ich in einem ersten Schritt die empirischen Befunde aus den Einzelbeiträgen in zentrale Thesen zusammen. Dabei gründen sich die vorgestellten Thesen übergreifend aus den vier Studienkontexten, sodass ein Wechselbezug zwischen den Einzelstudien hergestellt wird. In einem zweiten Schritt werden die Thesen systematisch zu einem Narrativ zusammengeführt und ein theoretisch-analytisches Programm vorgestellt, das Professionalisierung als Krisenbewältigung inszeniert.

7.1 THESEN

Aus den empirischen Befunden der vier Einzelbeiträge lassen sich fünf Thesen ableiten, die in einem engen Wechselverhältnis zueinanderstehen und zusammengenommen eine Beantwortung der eingangs in der vorliegenden Arbeit gestellten Frage nach dem Professionszustand des Clinician Scientists adressieren. Die Thesen haben einen erkenntnisorientierten, zum Teil aber auch einen eher programmatischen Charakter, welcher sich durch das analytische Vorgehen im Sinne einer pragmatischen Soziologie der Kritik bedingt.

Erste These: Translation besitzt einen rekursiven Charakter

Biomedizinische Forschung und medizinische Praxis sind, aufgrund von Spezialisierungs- bzw. Ausdifferenzierungstendenzen, auf der institutionellen Ebene mit relativ autonomen Reputationsmechanismen verknüpft. Dies zeigt sich an den Belohnungsprinzipien, die prinzipiell entweder wissenschaftliche Praktiken (Erkenntnisproduktion) oder medizinische Praktiken (Patientenpflege und -heilung) belohnen; in der Regel jedoch nicht beides zusammen. Translation adressiert von ihrer Eigenschaft her eine Re-Verbindung von biomedizinischer Forschung und medizinischer Praxis, wodurch sich der rekursive Charakter dieses Konzepts ausdrückt. Dieser rekursive Charakter, der eine Wiederzusammenführung von Forschung und Praxis anstrebt, kollidiert allerdings mit den gesellschaftlichen Entwicklungen, im Sinne einer Spezialisierung, was sich wiederum in den Belohnungsmechanismen spiegelt.

Zweite These: Translation setzt sowohl Integrations- als auch Desintegrationspotenziale frei

Aufgrund ihrer begrifflichen Offenheit (sogleich auch Unbestimmtheit) kann Translationale Forschung als Anknüpfungspunkt für diverse Problembereiche im Rahmen des biomedizinischen Erkenntnis- und Entwicklungsprozesses von verschiedenen Akteuren adaptiert werden. Dies verleiht dem Forschungskonzept eine rhetorisch-politische Anschlussfähigkeit und macht es

für unterschiedlichste Akteursgruppen zu einem Werkzeug, das zur Interessensvermittlung genutzt werden kann. Translation wird demgemäß auf einer rhetorisch-politischen Ebene anschlussfähig für Krisendiskurse und erhält damit eine inkludierende Eigenschaft. Die wissenschaftlichen Alltagsprobleme lassen sich sodann in gesellschaftlichen Krisendiskursen einhängen. ‚Innovationskrise' und ‚Produktionskrise' sind dabei als zwei konkrete Beispiele zu nennen, die sich empirisch als zentrale Krisendiskurse beobachten lassen. Auf der anderen Seite erschwert die Offenheit des Konzepts konkrete Übersetzungsstrategien für die praktische Handlungsebene, da zur Institutionalisierung, d. h. zur Stabilisierung von Handlungen, Erwartungssicherheiten vonnöten sind, die Translationale Forschung als ‚offenes' Konzept in der Form jedoch nicht gewährleisten kann. Damit exkludiert Translationale Forschung als Konzept insbesondere jene Akteure, die sie selbst als Schlüsselfiguren definiert, weil sie für die handelnden Subjekte keine ausreichenden Erwartungssicherheiten ermöglicht, die auf der handlungspraktischen Ebene eine Aufrechterhaltung von translationalen Rollenbildern erleichtert.

Dritte These: Die von den Clinician Scientists vollzogenen Translationspraktiken sind institutionell unzureichend verankert

Clinician Scientists bedienen mit ihren Tätigkeiten, die zwischen Patientenpflege und -heilung sowie Laborarbeit angesiedelt ist, Praktiken, die als translational gewertet werden können. Clinician Scientists sind durch ihre Rolleneigenschaften sowohl intra-personale als auch inter-personale Übersetzer/innen. Damit nehmen sie eine zweifache Übersetzungsfunktion wahr: Sie übersetzen zwischen zwei Rollen, die innerhalb einer Person angesiedelt sind und zwischen Personen aus interdisziplinären Kontexten. Darüber hinaus gelingt es ihnen zu Teilen die am Patientenbett (bedside) erlebten Gesundheitsprobleme in das Labor (bench) zu übertragen. Die Fähigkeit, eine zweifache Übersetzung zu praktizieren, macht sie vor dem Hintergrund der formulierten Translationsansprüche einzigartig. Es zeigt sich darüber hinaus zugleich, dass diese besonderen Fähigkeiten institutionell nicht ausreichend verankert sind, sodass es zu gesicherten Formen der

Professionalisierung kommen kann. Es existieren beispielsweise keine einheitlichen, ggf. mit Mindeststandards versehenen, Tätigkeitsprofile, die als institutionelle Referenzfolie für eine Translationspraxis herangezogen werden können.

Vierte These: Clinician Scientists können Translationspraktiken nicht konfliktfrei vermitteln, wodurch auf Ebene der Akteure Frustrationsmomente ausgelöst werden

Translationale Forschung führt auf der handlungspraktischen Ebene zu Frustrationserfahrungen, weil die im wissenschaftspolitischen Diskurs formulierten Anforderungen praktisch nicht konfliktfrei gelebt werden können. Bisweilen bietet die Translationale Forschung lediglich wenig Anhaltspunkte, wie Translation tatsächlich praktiziert werden kann. Jene Anhaltspunkte, die diskursiv vermittelt werden, können von den Betroffenen nicht reibungslos umgesetzt werden, wodurch Konfliktpotenziale freigelegt, aber de facto nicht ausreichend institutionell adressiert werden, sodass es zu einer systematischen bzw. erfolgreichen Bewältigung dieser Frustrationserfahrungen kommen kann.

Fünfte These: Eine unzureichende vermittelnde Ebene zwischen Diskurs und Praxis erschwert eine Krisenbewältigung

Zwischen den Anforderungen auf diskursiver Ebene und den handlungspraktischen Konflikten fehlt bisweilen eine verbindende Metaebene, welche die von den Akteuren (Clinician Scientists) an der handlungsstrukturierenden Umwelt (Translation) geäußerte Kritik auf fruchtbare Weise in den wissenschaftspolitischen Diskurs zurückspeist. Ohne eine derartige Metaebene verbleiben Anforderungen und individuelle Praxis in einem relativ passungsarmen Zustand. Clinician Scientists, als erlebte Schlüsselfiguren für die Translationale Forschung, sind im Wesentlichen über das Individuum selbst konstruiert, also qua persona und weniger über institutionelle Einheiten (wie bspw. Fachbereiche, Verbände, auf organisationaler Ebene agierende Ausbildungsprogramme etc.). Es fehlt somit

an institutionellen Anknüpfungspunkten, in denen die erlebten und durch die Erwartung ausgelösten Repressionserfahrungen bearbeitet bzw. verarbeitet werden können. Daher müssen die Repressionserfahrungen des Individuums stärker mit den diskursiven Translationsanforderungen verknüpft werden. Dies wird gegenwärtig zumindest partiell über die kommunikative Vermittlung auf öffentlichen Plattformen (wie bspw. den Science Blogs) vollzogen, die sodann eine verbindende kommunikative Metaebene zwischen Diskurs und Praxis stellen.

7.2 PROFESSIONALISIERUNG ZWISCHEN BESTÄTIGUNG UND KRITIK

Die Professionsentwicklung von Clinician Scientists im Feld der Translationalen Forschung wird im Rahmen der vorliegenden Dissertationsarbeit im Spannungsfeld von Konsolidierungsbestrebungen und Kritikpotenzialen gedeutet, dessen Dynamiken zu einem einfachen Narrativ verdichtet beschrieben werden können. Demnach begründet sich die Notwendigkeit Translationaler Forschung durch einen wissenschaftspolitischen Diskurs, welcher die Innovationsdefizite, -hemmnisse, und -hürden zum zentralen Krisengegenstand in der biomedizinischen Forschung erklärt. Translationale Forschung erhält einen anwendungsbezogenen Charakter, weil sie aufgrund ihrer Offenheit eine Lösung für diverse Probleme im Wissenstransfer anbietet und damit hinreichende Voraussetzung schafft, um auf diskursiver Ebene zu bestehen. Diese Anschlussfähigkeit mündet in einer permanenten Wahrheitsprüfung (Bestätigung) ohne, dass von den am Diskurs beteiligten Akteuren angezeigt werden muss, wie Translation tatsächlich praktiziert werden kann. Translation ist daher, einem eher positivistischen Verständnis nach, ein Konstrukt, das seine Legitimation darüber erfährt, dass es auf rhetorisch-politischer Ebene angewendet bzw. umgesetzt wird. Somit werden, ohne genaue Angaben, wie Translation auf individueller Ebene tatsächlich praktiziert werden kann, Erwartungen an die biomedizinische Praxis formuliert, die vorgeben, dass Handlungen translationsorientiert verlaufen sollten. Damit ist die

biomedizinische Forschungspraxis mit einem Zustand konfrontiert, der auf der einen Seite Zielsetzungen markiert, gleichsam aber durch große Unsicherheiten geprägt ist. Die Erwartung an eine translationsorientierte Handlungspraxis führt bei den beteiligten Akteuren zu Unsicherheitserfahrungen, die sich in den existenziellen Prüfungen der betroffenen Akteure offenbaren, die sodann anzeigen, dass die individuellen Handlungsmotive zum Teil im Konflikt mit den institutionellen Arrangements (Erwartungen) stehen. Dergestalt geraten Erwartungen und Handlungen in einen relativ passungsarmen Zustand, was jedoch nicht bedeutet, dass keinerlei Passungen zwischen beiden Ebenen auftreten. Die Passung zwischen diskursiver Erwartungsebene und Handlungsebene ist von gradueller Natur, was sich darin zeigt, dass Clinician Scientists durchaus Praktiken vollziehen, die von den umgebenen Akteuren in Wissenschaft und Medizin als translational beschrieben werden können.

Nichtsdestotrotz führen Passungsschwierigkeiten auf der individuellen Ebene zu subjektiv empfundenen Konfliktzuständen, die von den Akteuren über Empörung konkret zum Ausdruck gebracht werden. Dabei zeigt sich zunächst, dass die von den Clinician Scientists formulierte Kritik auf eine Weise formuliert ist, die eine Anschlussfähigkeit an Krisendiskurse wie ‚getrennte Welten' oder das Tragen von ‚zwei Hüten' herstellt. Zusammengefasst deuten derartige Krisen auf bestehende Rollenkonflikte, die sich auf einer diskursiven Ebene als besonders anschlussfähig erweisen. Sie werden von den Akteuren als gültige Probleme anerkannt, was sich darin zeigt, dass sie keiner weiteren Erklärung bedürfen. Auf einer oberflächlichen Ebene richtet sich die Kritik somit an die Zusammenführung ‚zweier unterschiedlicher Welten', die auf individueller Ebene nicht abgefangen werden kann. Wird die von den Akteuren artikulierte oberflächliche Kritik von den Forschenden systematisch in eine Form der Empörung übersetzt, dann offenbaren sich konkretere Momente der subversiven Kritik, die sich an die Umwelt richten. Damit wird Translation, als strukturierende Form von Umwelt, einer Realitätsprüfung unterzogen, die sodann die Momente der Passungsschwierigkeiten und ihre Konsequenzen erkennen lassen.

Unbestimmt bleibt dabei allerdings, inwiefern die von den Akteuren formulierte Kritik den Diskurs um die Translationale Forschung tatsächlich

erreicht und schließlich praktisch umgesetzt wird. Derartige Kausalitäten können mithilfe der hier vorliegenden Datengrundlage weder aufgestellt noch geprüft werden und verbleiben daher auf einer rein spekulativen Ebene, die weiteren Prüfungen bedürfen. Wenn man aber den professionellen Zustand des Clinician Scientists analytisch als eine Krise inszeniert und die empirischen Befunde berücksichtigt, eröffnet das hier skizzierte Narrativ eine mögliche, nicht aber eine allgemeingültige, Erklärung für den Zustand des Clinician Scientists: Solange die von den Akteuren formulierte Kritik nicht diskursiv verarbeitet und dann wieder als re-formulierte Erwartungen auf die Handlungsebene übertragen werden, verpufft die von den betroffenen Akteuren formulierte Kritik. Der Clinician Scientist verbleibt dann zwangsläufig als ein sogenannter „Tausendsassa", dessen politisch-rhetorische Anschlussfähigkeit seinesgleichen sucht, auf praktischer Ebene jedoch Formen der Repression erleidet, die möglichweise eine professionelle Unabhängigkeit, im Sinne der Entstehung eines eigenständigen Berufsbildes, be- bzw. verhindern.

8 FAZIT

Die vorliegende Arbeit ist mit der Problematisierung des Clinician Scientists im Kontext der Translationalen Forschung gestartet. Dabei ging es insbesondere darum, die professionelle Beschaffenheit des Clinician Scientists in den Vordergrund der Analyse zu rücken und konkreter danach zu fragen, inwiefern es sich bei dieser Gruppe um eine eigenständige Profession handelt, die von ihren benachbarten Professionen – Medizin und Forschung – losgelöst gedacht werden kann. Ausgangspunkt dieser Frage war die Feststellung, dass Clinician Scientists (noch immer) keine unabhängige Profession darstellen, wie beispielsweise die Medizin oder die Wissenschaft, obwohl die Akteure in eine Umgebung eingebettet sind, die hinsichtlich einer Professionsentwicklung eher als unterstützend gewertet werden kann. Da die faktische Ausgangslage ‚keine Profession' die Frage nach dem Professionszustand im Grunde überflüssig erscheinen lässt, handelt es sich demnach in der vorliegenden Arbeit nicht um eine ‚Entweder-oder-Frage', sondern nur um eine graduelle Unterscheidung, deren Antwort auf empirischer Basis getroffen wird. Professionalisierung wird damit zu einem relativen Konzept, dem sich die Akteure durch ihre gelebten Handlungspraktiken nähern können. Die Bewertung über die graduelle Nähe zum Professionsstatus geschieht über die Beobachtungsperspektive der Forschenden.

Um sich der Frage aus einer neuen Perspektive widmen zu können, wurde auf einen neo-pragmatischen Ansatz als Heuristik Bezug genommen, der es ermöglicht, Fragen der Professionalisierung im Wechselspiel zwischen Diskurs- und Handlungspraxis zu deuten, die über die Ebene der Kritik miteinander verbunden sind. Die Kombination aus neo-pragmatischen und professionssoziologischen Ansätzen zeigt sodann, wie auf Subjektebene das ‚Translationsproblem' beantwortet, – oder konkreter – reproduziert wird. Damit leistet die vorliegende Arbeit einen Beitrag zum allgemeinen Forschungsstand über die Situation des Clinician Scientists, darüber hinaus offeriert sie aber auch potenzielle Lösungsvorschläge, wie die in dieser Forschung identifizierten Probleme behandelt werden können. Denn die hier eingeschlagene Sichtweise reformuliert den Professionszustand in einen

Krisenzustand, der von den Akteuren be- bzw. verarbeitet wird. Wenn, wie vorliegend angenommen, sich der professionelle Zustand des Clinician Scientists in einer ‚Krise' befindet, muss danach gefragt werden, was die Krise auslöst und welche Mechanismen dazu beitragen können, die Krise zu überwinden.

Durch die im Rahmen der vorliegenden Arbeit gewonnenen empirischen Erkenntnisse ergeben sich konkrete Hinweise darauf, die auf eine Professionalisierung des Clinician Scientists hindeuten. Dazu gehören insbesondere die vom Clinician Scientist vollzogenen Praktiken, die von den benachbarten Professionen Wissenschaft und Medizin als ‚translationale Praktiken' gedeutet werden. Damit kommen Clinician Scientists dem über den Diskurs gesetzten Anspruch nach Translationalität nach. Das Vollziehen dieser Praktiken allein ist allerdings nicht ausreichend, um eine eigenständige Profession auszubilden. Dafür bedarf es, so zeigt die empirische Analyse ferner, konkreter institutioneller Unterstützungsverfahren, die Translation nicht nur über ‚individuelle Köpfe', also qua persona, sondern über ‚Institutionen' denkt. Mithilfe derartiger institutioneller Arrangements, wie beispielsweise einheitliche und mit Mindeststandards versehene Programme, Verbände oder klare Tätigkeitsbeschreibungen lassen sich sodann auch die individuell erfahrenen Krisenzustände, die oberflächlich als ‚Leben in getrennten Welten' dokumentiert werden, systematisch auf einer institutionellen Ebene bearbeiten, die bisweilen nur vereinzelt öffentlich (beispielsweise über Science Blogs) kommuniziert und verarbeitet werden[30]. Die individuelle Krise der betroffenen

[30] Die Kritik, die innerhalb der Interviews mit Clinician Scientists verbalisiert wurde, die hier insbesondere im Rahmen der Studie II (siehe Kap. 3) verhandelt wird, kann ebenso als eine öffentliche Kritik gedeutet werden und zwar insofern, dass diese Arbeit, sobald sie veröffentlicht ist, Teil des öffentlichen Wissenschaftsdiskurses wird. Solange eine Publikation dieser Dissertationsarbeit – und damit eine öffentliche Auseinandersetzung mit der Kritik der Individuen – noch nicht vollzogen ist, verbleibt diese Perspektive auf einer anderen analytischen Ebene der Kritik, die hier sodann unberücksichtigt bleibt bzw. bleiben muss. Die zwei Ebenen der Kritik verschieben sich zusammen mit der Position der Forschenden (als Anwälte): In der ersten Position legen die Forschenden die bereits im Diskurs vorhandenen öffentlichen Kritiken analytisch für ein spezifisches Publikum frei (wie es in den Studien um die Science Blogs der Fall ist). In der zweiten Position tragen die Forschenden die in den

Akteure begründet sich, das zeigen die Ergebnisse weiter, durch eine translationsorientierte Umwelt, die in den einzelnen Situationen eher auf Spezialisierung, denn auf eine Fragmentierung von Berufsbildern setzt. Wenn Clinician Scientists jedoch Fragmentierung als zentrales Element verkörpern, müssen die umliegenden situativen Bewertungsmechanismen darauf eingespielt werden, sodass es zu einer erfolgreichen Karriereentwicklung des Clinician Scientists kommen kann.

Gegenwärtige Entwicklungen, wie sie den neuen Empfehlungen zur „Etablierung einer wissenschaftsorientierten Personalentwicklung für Fachärztinnen und Fachärzte in der Universitätsmedizin" der Deutschen Forschungsgemeinschaft (DFG 2018) zu entnehmen sind, zeigen just eine derartige Richtung an. In diesen Empfehlungen wird, zumindest im wissenschaftspolitischen Diskurs, zum ersten Mal nicht mehr das Individuum ins Zentrum der Translation gesetzt, sondern die organisatorische Einheit des Advanced Clinician Scientist Programms. So heißt es im aktuellen Papier der Deutschen Forschungsgemeinschaft: „Damit trägt dieses Programm dazu bei, die Leistungsfähigkeit der Universitätsmedizin im internationalen Wettbewerb zu erhalten und auszubauen" (DFG 2018, 6); wobei es drei Jahre zuvor noch hieß: „Diese Clinician Scientists spielen nicht nur in der Klinischen Forschung eine zentrale Rolle, sie sind für die gesamten Lebenswissenschaften von zentraler Bedeutung. Zudem ist allein dieser Personenkreis Garant für eine Verbindung von reiner Grundlagenforschung und klinisch motivierter Grundlagenforschung in den Lebenswissenschaften. Dem [Clinician Scientist] kommt somit eine Schlüsselrolle beim Erhalt der Innovationskraft […] zu" (DFG 2015, 9). Das Programm ersetzt damit den individuellen Clinician Scientist mit einem institutionellen Gefüge. Ob die hier eingeleitete Verschiebung von einer Personalisierung hin zu einer Institutionalisierung eine Professionalisierung oder zumindest eine Stärkung dessen als Folge mit sich bringen wird, wird sich (empirisch) zeigen müssen. Unbestimmt bleibt darüber hinaus, welche Faktoren retrospektiv zu einer Stärkung geführt haben und ob

Interviews formulierte Kritik, die methodisch angeleitet hervorgebracht wird, mit einer Publikation der Forschungsarbeit in die Öffentlichkeit.

Professionalisierung tatsächlich ein Zustand ist, der als Krisenbewältigung interpretiert werden kann. Dazu ist eine weitere und systematischere Auseinandersetzung mit der Entwicklung des Berufsbildes des Clinician Scientists im nationalen wie internationalen Kontext vonnöten.

Ferner – und mit diesem kritischen Plädoyer endet sodann die vorliegende Arbeit – muss das Verhältnis von Professionssoziologie und pragmatischer Soziologie der Kritik vertiefter (als es in der vorliegenden Arbeit geschehen ist und geschehen konnte) in den Mittelpunkt und für derartige Untersuchungen, wie sie hier vorliegen, definiert werden. Wenn eine Soziologie der Kritik, mit ihren (neo-)pragmatischen Zugängen zur (empirischen) Welt, eine Professionsanalyse bestimmt und vorantreibt, dann ergeben sich konkrete Fragen nach der theoretisch-konstitutiven Setzung dieses Verhältnisses und aus einer reflexiv-kritischen Position einer Wissenschaftsforschung zunehmend Fragen nach einer legitimen Form dieser In-Bezugnahme der beiden soziologischen Stränge. Das Verhältnis dieser beiden Soziologien erklärt sich auf Basis der vorliegenden Arbeit in erster Instanz über empirisch-analytische Engpässe, die eine Professionssoziologie durch ihren zentralen Charakter der Kategorisierung als beschreibendes und erklärendes Moment aufweist. In den Modi ihrer Beobachtungsreichweiten und in den Aufgaben, die sie als Soziologien vorantreiben, erscheinen diese beiden Soziologien zunächst lediglich schwer miteinander vereinbar. Daher muss eine kritische Kritikanalyse, die ein Dreigespann formuliert zwischen (1) Kritik der Akteure als Sprachrohr zur Welt, (2) Emanzipierungsversuchen der Akteure im Sinne einer Freilegung von Professionalisierungstendenzen, und einer (3) symmetrisch-advokativen Beziehung zwischen Forschenden und Akteuren im Feld, zumindest den Anspruch erheben, die Leitsätze beider Soziologien in ein adäquates Verhältnis zu setzen, will sie sich nicht in einem einfachen Modus Operandi verlieren.

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10 ABBILDUNGSVERZEICHNIS